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9 PM Current Affairs Weekly Compilation

For UPSC CSE mains examination

2nd Week
November. 2025

Features :

Arranged as per syllabus Topics
Most complete coverage of major News Papers editorials

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Nutritional Transformation Needed in India

Introduction

India must shift from **food security** to **nutritional security**. **Child undernutrition remains high** even as diets and incomes change. The path forward is a **sustainable, nutrient-rich food system** where **functional foods** and **smart proteins** help close protein and micronutrient gaps without worsening environmental stress.

Functional Foods

Functional foods are **enriched or fortified foods** designed to promote health or prevent disease. For example, vitamin-enriched rice, omega-3-fortified milk, probiotic yoghurt, and similar products go beyond basic nutrition.

Supporting technologies: They rely on advanced technologies such as **nutrigenomics** (nutrition-gene interaction), **bio-fortification**, **bioprocessing**, and **3D food printing**. Together, these innovations improve nutrient absorption and help in targeted delivery of vitamins and minerals within the body.

Smart Proteins

Smart proteins are **biotechnologically produced proteins** that reduce dependence on livestock. They include:

- **Plant-based proteins** extracted from legumes and cereals.
- **Fermentation-derived proteins** produced through microbial systems.
- **Cultivated meat**, grown from animal cells in bioreactors.
  These are designed to mimic animal-based foods while lowering the environmental footprint.

Need for Functional Foods in India:

1. **High Undernutrition:** Despite being a major food producer, India faces high rates of child stunting (35.5% under 5) and underweight (32.1% under 5) as per NFHS-5. Widespread anemia (57% of women of reproductive age) is also a major issue.

2. **Double burden:** Rising **obesity** and **non-communicable diseases** alongside undernutrition.

3. **Food Insecurity:** Factors like climate change and rising food costs exacerbate food access issues, with the Global Hunger Index ranking India at 105 out of 127 in 2024.

4. **Diet transition & urban stressors:** Rapid urbanisation, air pollution links to diabetes risk, and convenience diets increase the need for fibre-rich, antioxidant, low-GI, and cardioprotective foods.

5. **Sustainability Challenge:** India needs **climate-resilient nutrition pathways** because **livestock supply chains contribute ~14.5% of global GHG emissions**, so diversifying toward smart proteins and biofortified crops is required to meet health goals without overshooting environmental limits.

6. **Economic loss:** World Bank analyses estimate **2–3% of GDP losses** in countries like India due to malnutrition, which means investments in fortification, biofortification, and better diets yield high productivity returns.

7. **Policy Imperative:** Building a **climate-conscious, resilient, and nutrient-rich food system** is crucial for India's long-term development goals and aligns with initiatives such as *Lifestyle for Environment (LiFE)* and *Viksit Bharat 2047*.

Current Status of Functional Foods

National Progress and Policy Support

- India recognizes functional foods and smart proteins under its **Biotechnology for Economy, Environment, and Employment (BioE3) Policy**.
- The **Department of Biotechnology (DBT)** and **Biotechnology Industry Research Assistance Council (BIRAC)** are promoting R&D and funding biomanufacturing hubs.

Research and Industrial Developments

- **Bio-fortified crops**: Zinc-enriched rice (IIRR, Hyderabad) and iron-rich pearl millet (ICRISAT).
- **Private sector participation**: Companies like *Tata Consumer Products, ITC, and Marico* have invested in fortified staples and health-focused food products.
- **Smart protein ecosystem**: Over **70 brands** offer around **377 plant-based or fermentation-derived products**.
  Startups such as *GoodDot, Blue Tribe Foods,* and *Evo Foods* lead the plant-based meat segment, while *Zydus Lifesciences* has entered fermentation-based proteins through a **₹4.5 crore DBT-supported grant** for cultivated meat research.

Global Comparison

- **Japan** pioneered functional food regulation in the 1980s.
- **Singapore** approved the first sale of cultivated chicken in 2020.
- **China** and the **EU** are investing heavily in alternative protein production as part of their **food security and "Farm to Fork" strategies**.
  These examples underline the growing international momentum that India must match.

Major Concerns Related to Functional Foods in India

1. Regulatory clarity and standards: FSSAI has not yet issued **definitive guidance** for **cultivated meat** or **precision-fermented proteins**. Without clear **definitions, safety evaluation, and labelling**, **mislabelled or unverified products** could reach consumers.

2. **Infrastructure gaps:** India lacks **large-scale fermentation capacity**, **quality certification**, and **consumer testing infrastructure** necessary to scale reliably.

3. **Innovation and Skill Gaps:** Transitioning to biomanufacturing demands **large-scale workforce upskilling**. Without it, innovation may concentrate among a few corporations, excluding small farmers and startups.

4. **Public Perception Challenges:** Many consumers remain **skeptical about "lab-made" food**. Overcoming this perception requires transparent communication and **trust-building** through accurate labeling and awareness campaigns.

5. **Uneven Access and Affordability:** Functional foods currently remain **urban-focused and premium-priced**, which could widen the nutritional divide if not scaled inclusively.

Way Forward

1. Need strong regulatory framework: The **Food Safety and Standards Authority of India (FSSAI)** must develop **clear definitions, safety evaluation procedures, and labeling norms** for functional and smart protein foods. This framework should align with global standards while promoting indigenous innovation.

2. Strengthening Inter-Ministerial Coordination: Close cooperation among **DBT, FSSAI, MoHFW, and Ministry of Agriculture** is essential to ensure **policy coherence** and effective implementation of the BioE3 vision.

3. Building Biomanufacturing Infrastructure: Public-private partnerships should focus on setting up **fermentation and bioprocessing facilities**, quality testing labs, and R&D hubs to accelerate commercialization.

4. Capacity Building and Workforce Training: Developing a **skilled biotechnology workforce** is critical. Training programs under BioE3 can empower youth and scientists to innovate in **processing, smart packaging, and food safety technologies**.

5. Inclusion and integration: Linking farmers with new value chains through **climate-smart crops** such as millets, sorghum, and legumes can create rural employment while ensuring environmental sustainability.

6. Public awareness: Transparent communication campaigns should highlight **health and sustainability benefits** of functional foods, promoting wider acceptance and informed choices.

Conclusion

India stands at a pivotal moment: address **malnutrition** while building a **sustainable food system**. **Functional foods** and **smart proteins** can **upgrade daily diets**, **ease environmental pressure**, and **improve productivity**. With **BioE3**, **DBT/BIRAC** support, **robust FSSAI standards**, **biofoundries**, and **farmer and consumer inclusion**, India can secure **nutritional security**, catalyse **jobs and innovation**, and build a **resilient, climate-conscious** food future.

Question for practice:

Discuss why India needs functional foods and smart proteins, and the key measures to scale them responsibly.

Source: The Hindu

The Case of Mounting Debt Pile in South India

UPSC Syllabus Topic: GS Paper 3 -Indian economy.

Introduction

Rising household **indebtedness in South India** reflects a **complex economic pattern.** It signals both greater financial access and growing reliance on credit. The trend invites attention to **regional disparities, socio-economic factors influencing borrowing, and the broader impact of inclusive finance.** Understanding these dimensions helps assess whether rising debt represents financial empowerment or emerging vulnerability in an increasingly credit-driven economy.

Current Status of Indebtedness in India

1. **Definition**: Indebtedness counts any person aged 15 or above who owes **₹500 or more** to a bank, cooperative, or informal lender.

2. **Coverage:** In **2021, about 15% of adults** had outstanding loans. This gives a clear, comparable baseline across states.

3. Borrowing is concentrated in the South:

- **Andhra Pradesh has the highest share, with over two in five adults indebted.**
- **Telangana (37.2%), Kerala (29.9%), Tamil Nadu (29.4%), Puducherry (28.3%), and Karnataka (23.2%) also sit above the national average.**
- Older **All-India Debt and Investment Survey data (2013–2019)** also placed the South ahead.
- **RBI's Financial Stability Report** notes higher debt-to-asset ratios in southern rural and urban households.

4. Low-indebted states and UTs: Several regions show very low indebtedness. **Delhi (3.4%)**, **Chhattisgarh (6.5%)**, **Assam (7.1%)**, **Gujarat (7.2%)**, **Jharkhand (7.5%)**, **West Bengal (8.5%)**, and **Haryana (8.9%)** are at the lower end. These figures highlight wide interstate variation in household exposure to loans.

Indebtedness Connection to Other Parameters

1. Income Level: As income rises, borrowing also increases. **High-income households (top quartile)** show **almost double the indebtedness** of the **lowest-income group**. Richer families often borrow more for consumption, investment, or asset creation, while poorer ones remain credit-averse or dependent on informal sources.

2. Household Size: Smaller families tend to borrow more. **Households with fewer than four members show 17.8% indebtedness**, while **large families (eight or more)** show only **10%**. Bigger families may rely on pooled income, reducing the need for loans.

3. Occupation: The self-employed and regular workers borrow more due to business or lifestyle needs. **Self-employed (32%)**, **salaried (22.8%)**, and **casual labourers (22.5%)** show high exposure, whereas students, unemployed persons, and those with disabilities borrow the least.

4. Social Groups: Borrowing differs by community and caste. **OBCs (16.6%)** are most indebted, followed by **SCs (55% higher likelihood)**, while **STs (11%)** are the least indebted.

5. Religious Groups: Among religions, the likelihood of borrowing is **12% lower among Muslims** and **15% lower in other faiths** compared to Hindus.

6. Age: Middle-aged adults (30–59 years) are most indebted as they handle household and career responsibilities.

7. Marital Status: Married men from high-income families record the highest indebtedness, showing the link between family obligations and credit use.

Financial Inclusion Across Regions

1. **Overall reach:** Financial access is broad but uneven across India. In 2020–21, 87.2% of people aged 15 and above had an account, and national coverage remains above 87%.

2. Leaders among larger states: The South is ahead. **Karnataka 95.9%**, **Andhra Pradesh 92.3%**, **Tamil Nadu 92%**, **Kerala 91%**. **Chhattisgarh 91.1%** also performs well.

3. **Lower coverage: Meghalaya 65.5%** marks the lower end, showing large interstate gaps that persist despite overall gains.

4. Small states and UTs near universal: Several smaller states and Union Territories are **close to universal access**. Andaman and Nicobar Islands record 97.5%, Dadra and Nagar Haveli 96.35%, Goa 95.8%, Himachal Pradesh 95.6%, and Puducherry 95.4%.

Conclusion

Southern indebtedness mirrors economic dynamism supported by financial inclusion, yet it demands balance and oversight. Strengthening credit discipline, improving financial literacy, and ensuring equitable access across regions can sustain this growth without triggering distress. The goal is to keep credit empowering, not burdensome, within a responsible and inclusive financial system.

Question for practice:

Examine the factors contributing to high household indebtedness in South India and assess the role of financial inclusion in this trend.

Source: The New Indian Express

Bihar's Makhana Potential

Source: The post **"Bihar's Makhana Potential"** has been created, based on **"Bihar's Makhana Potential"** published in "The Hindu Businessline" on 10th November 2025.

UPSC Syllabus: GS Paper 3 – Indian Economy

Introduction: Bihar is the largest producer of makhana (fox nut) in India, accounting for about 90 percent of national production and nearly 90 percent of the global supply. Despite this dominance, Bihar has not been able to establish itself as a major exporter due to structural and technological limitations. Makhana is now gaining recognition as a gluten-free, protein-rich superfood with growing global demand, presenting Bihar with a major opportunity for economic development.

Present Status of Makhana Production in Bihar

1. Makhana is traditionally cultivated in shallow ponds by the Mallah community using labour-intensive methods.
2. The production system remains largely informal and small-scale, lacking standardisation and mechanisation.
3. Most value-added processing and export operations are handled by other states such as Punjab and Assam.

Major Challenges

1. **Lack of scale:** Bihar's makhana sector suffers from low production volumes, making it difficult to achieve economies of scale necessary for large-scale export.
2. **Low value addition:** The initial stages of production are low-value and labour-intensive, while higher-value post-production activities are concentrated outside Bihar.
3. **Quality issues:** Until 2022, makhana did not have a separate identification code in trade data, which limited its recognition as a unique product.
4. **Certification gap:** There is inadequate certification for food safety, quality, and environmental standards, making it less competitive internationally.
5. **Technological backwardness:** Traditional pond-based systems result in longer crop durations and inconsistent quality. Modern field-based systems and improved varieties have not been adopted widely.
6. **High fixed costs:** Small-scale production leads to higher costs that can only be offset by scaling up cultivation and processing.

Opportunities and the Way Forward

1. **Scaling up production:** Bihar needs to expand makhana cultivation from pond-based to field-based systems, which shorten crop cycles and improve consistency.
2. **Technological upgradation:** Investment in advanced processing technology can ensure better-quality pops that are larger, lighter, and suitable for premium markets.
3. **Diversification:** The state should promote the development of diversified makhana-based products for health, food, and medicinal uses.
4. **Certification and branding:** The 2022 Geographical Indication (GI) tag can be leveraged to build brand recognition and fetch higher export prices.
5. **Institutional support:** The government should facilitate farmer cooperatives, public–private partnerships, and targeted financial assistance to encourage investment in processing and export infrastructure.
6. **Quality assurance:** Independent certification systems should be encouraged to promote food safety, sustainability, and environmental compliance.

7. **Skill development:** Training programs for farmers and processors can help in adopting modern methods and achieving higher productivity.

Conclusion Bihar's makhana industry mirrors the situation of cocoa production in Africa, where raw producers earn little despite global demand. To realize its full potential, Bihar must focus on scaling up, modernizing production, ensuring quality certification, and strengthening value chains within the state.With coordinated policy support, technological innovation, and effective branding, makhana can become a driver of rural income, employment, and global competitiveness for Bihar.

Question: Bihar's makhana industry holds immense potential but faces challenges in scaling and certification. Discuss.

Expectations from COP30 of United Nations Framework Convention on Climate Change (UNFCCC)

Source: The post **"Expectations from COP30 of United Nations Framework Convention on Climate Change (UNFCCC)"** has been created, based on **"Expectations from COP30 of United Nations Framework Convention on Climate Change (UNFCCC)"** published in "The Hindu" on 10th November 2025.

UPSC Syllabus: GS Paper 3 – Environment

Context: The **30th Conference of Parties (COP30)** under the **United Nations Framework Convention on Climate Change (UNFCCC)** is being held in **Belém, Brazil**, marking a decade since the adoption of the **Paris Agreement (2015)**. It is being termed the **'Implementation COP'** as it is expected to transform climate commitments and pledges into **concrete and actionable steps**. The summit is taking place against the backdrop of **rising global temperatures, record-breaking heat waves, worsening climate disasters, and delayed climate finance**, which have widened the gap between global promises and actual implementation.

Significance of COP30

1. COP30 comes at a **crucial juncture** when the international community is expected to take decisive action to keep the **temperature rise below 1.5°C** above pre-industrial levels.
2. Hosting the summit in **Belém**, at the edge of the **Amazon rainforest**, is both symbolic and strategic since the Amazon is a **vital carbon sink storing 150–200 billion tonnes of carbon** and is now threatened by deforestation and land conversion.
3. The summit provides an opportunity to **rebuild global trust** by strengthening commitments on climate finance, equity, and inclusion between developed and developing nations.
4. It aims to ensure that climate action is based on the principles of **equity, common but differentiated responsibilities (CBDR)**, and inclusive participation.

Key Expectations from COP30

1. **Implementation of Climate Commitments:** COP30 is expected to move beyond rhetoric and deliver on the commitments made under the **Paris Agreement**, focusing on measurable progress through the **Global Stocktake (GST)**, which reviews countries' efforts every five years.
2. **Guidance by the Global Stocktake (GST):** The GST will guide countries to identify policy and financing gaps, align new targets with scientific evidence, and draft **updated plans for mitigation, adaptation, and implementation**.

3. **Focus on Six Thematic Areas:** The summit will focus on six major areas— Energy, industry, and transport transitions, Stewardship of forests, oceans, and biodiversity, Transformation of food systems, Urban resilience and infrastructure adaptation, Sustainable water management and Human and social development linked to climate resilience.
4. **Mobilisation of Climate Finance:** The **Baku-to-Belém Roadmap**, jointly led by **Azerbaijan and Brazil**, aims to scale up finance for developing nations to **$1.3 trillion per year by 2035**, based on the **$300 billion New Collective Quantified Goal (NCQG)** finalised at **COP29**.
5. **Operationalising the Global Goal on Adaptation (GGA):** COP30 is expected to finalise the **long-pending GGA framework**, setting quantifiable adaptation targets, metrics for resilience, and financing mechanisms.
6. **Addressing the Finance Gap:** The **Loss and Damage Fund**, created at **COP28**, has received less than $1 billion against annual needs of hundreds of billions. COP30 must establish **clear reporting, financing, and accountability mechanisms** to restore confidence among developing nations.
7. **Ensuring a Just Transition:** COP30 must promote **equitable low-carbon transitions**, ensuring that economic growth, livelihoods, and energy access in developing nations are not compromised.
8. **Strengthening Technology and Capacity Building:** Access to **affordable clean technology** and capacity-building initiatives will be crucial to help developing countries achieve low-carbon growth despite **intellectual property barriers and high costs**.
9. **Enhancing Nationally Determined Contributions (NDCs):** Countries are expected to submit **updated and ambitious NDCs for 2035**, but as of now, only **19% of global emissions** are covered by submitted plans. COP30 will push for greater ambition and accountability.
10. **Integration of Climate and Biodiversity Goals:** Brazil will champion the **"Tropical Forest Forever Facility"**, which seeks to compensate over **70 tropical forest countries** for their conservation efforts, linking climate finance directly to forest and biodiversity protection.
11. **Promoting Inclusion and Participation:** COP30 must ensure that **low-income nations, indigenous communities, and civil society groups** have fair representation, despite the logistical and financial challenges posed by hosting the summit in Belém.

Major Challenges

1. **Inadequate Climate Finance:** Current commitments, even under the NCQG, fall far short of the **trillions required annually** for meaningful mitigation and adaptation in developing nations.
2. **Dilution of the CBDR Principle:** The term "**all actors**" used in financing includes private investors, philanthropies, and developing countries themselves, which **dilutes historical responsibility** of developed nations.
3. **Technology Barriers:** Developing nations struggle with limited access to clean technology due to **patent restrictions, high costs, and limited cooperation** from developed countries.
4. **Low Ambition and Delayed Implementation:** Many nations have failed to submit updated NDCs, and global emissions continue to rise, making the **1.5°C goal increasingly unattainable**.
5. **Underfunded Loss and Damage Mechanism:** The Loss and Damage Fund remains **grossly underfinanced**, leaving vulnerable countries without adequate support to cope with extreme climate events.
6. **Logistical and Inclusivity Concerns:** Hosting COP30 in Belém has resulted in **skyrocketing accommodation costs**, restricting participation from smaller delegations and **undermining inclusivity**.
7. **Political Divergence:** Differences between the **Global North and South** persist over emission responsibilities, finance distribution, and technology sharing.

Way Forward

1. **Scale Up and Streamline Climate Finance:** Developed nations must ensure **predictable and transparent funding** exceeding $1.3 trillion annually with clear accountability mechanisms.
2. **Finalise and Implement the Global Goal on Adaptation:** The GGA should include **quantifiable regional targets**, adaptation finance, and measurable resilience indicators.
3. **Ensure Technology Access and Collaboration:** There should be **North–South and South–South partnerships** for affordable technology transfer, innovation, and capacity building.
4. **Reinforce Climate Justice and CBDR:** COP30 must reaffirm the principle that **historically responsible nations** should lead in financing and emission reductions.
5. **Promote Just and Inclusive Transitions:** Economic diversification, green skill development, and livelihood protection should accompany decarbonisation efforts.
6. **Integrate Climate and Biodiversity Finance:** Mechanisms like the **Tropical Forest Forever Facility** should be expanded to fund **ecosystem restoration, agroforestry, and community conservation**.
7. **Enhance Transparency and Accountability:** COP30 should strengthen **Global Stocktake reporting systems** to monitor real progress in finance, mitigation, and adaptation.
8. **Empower Local and Indigenous Knowledge:** Incorporating traditional resilience practices such as **India's water harvesting, seed conservation, and community forest management** can enhance local adaptation.
9. **Improve Inclusivity:** The UNFCCC process should support **participation of low-income and vulnerable countries** through logistical and financial assistance.

Conclusion

COP30 represents a defining moment for global climate governance, aiming to transform the **Paris Agreement's vision into real-world results**. The **Amazonian setting** underscores the urgency of protecting ecosystems while addressing emissions, equity, and finance gaps. For developing nations like **India**, COP30 is an opportunity to advocate **climate justice, fair finance, and sustainable growth**. The success of COP30 will depend on whether it can deliver a **credible, inclusive, and implementable roadmap** that aligns with science, strengthens equity, and ensures a sustainable and resilient future for all.

Question: What are the key expectations from COP30 of the United Nations Framework Convention on Climate Change (UNFCCC)? Discuss its significance, major focus areas, challenges, and the way forward.

India's AI Guidelines for Tech Regulation

UPSC Syllabus Topic: GS Paper 2 -Government policies and interventions for development in various sectors and issues arising out of their design and implementation.

Introduction

India has unveiled governance guidelines for Artificial Intelligence to **balance innovation with accountability** and **growth with safety**. The approach prefers **agile, sector-specific regulation** over an immediate new AI law. It proposes an **India-specific risk framework**, **AI incident database**, **content authentication** for deepfakes, and **techno-legal safeguards** embedded in system design, ahead of the **India–AI Impact Summit 2026**.

Need for India AI Governance Guidelines

1. Harnessing AI while limiting harm: India aims to **use AI for inclusive development and competitiveness** while managing risks to people and society. Use is expanding fast, including **large language models**, demanding clarity on responsibility, safety research, and risk classification.

2. Avoiding premature over-regulation: The stance is to **not tighten rules immediately**. The goal is to let an **innovation economy** flourish while preparing guardrails such as **risk assessment**, **voluntary frameworks**, and **grievance mechanisms**.

3. Deepfake and content authenticity challenge: Synthetically generated images, videos, and audio require content authentication. Draft amendments to IT Rules propose declarations by uploaders, platform verification, and visible labels; non-compliant platforms risk losing safe-harbour.

4. Public-sector exposure risks: There are **privacy and inference risks** when officials use AI systems. At scale, prompts may reveal priorities or patterns. There is debate on **protecting official systems from foreign AI services** and on potential uses of **anonymised mass data** by global firms.

Guiding Principle of AI Governance Guidelines

1. "Do No Harm" with flexible sandboxes: The central ethic is **"Do No Harm."** Innovation should occur in **sandboxes**, with **risk mitigation** built into a **flexible, adaptive** governance system.

2. People-centric and law-first approach: Policy remains **human-centric**. It relies on **existing laws**—notably the **IT Act** and the **Digital Personal Data Protection Act**—and fills **gaps through targeted amendments** rather than creating a standalone AI statute now.

3. Seven guiding principles : Seven guiding principles or sutras have been adapted from the **RBI's FREE-AI Committee report** to guide the overall approach. These principles have been adapted for application across sectors and aligned with national priorities.

Trust is the Foundation: Without trust, innovation and adoption will stagnate.
People First: Human-centric design, human oversight, and human empowerment.
Innovation over Restraint: All other things being equal, responsible innovation should be prioritised over cautionary restraint.
Fairness & Equity: Promote inclusive development and avoid discrimination.
Accountability: Clear allocation of responsibility and enforcement of regulations.
Understandable by Design: Provide disclosures and explanations that can be understood by the intended user and regulators.
Safety, Resilience & Sustainability: Safe, secure, and robust systems that are able to withstand systemic shocks and are environmentally sustainable.

Key Issues in AI Governance in India

key issues in AI governance from India's perspective & makes recommendations across **six pillars are:**

1. Infrastructure: Enable innovation and adoption of Al by expanding access to foundational resources such as data and compute, attract investments, and leverage the power of digital public infrastructure for scale, impact and, inclusion.

2. Capacity Building: Initiate education, skilling, and training programs to empower people, build trust, and increase awareness about the risks and opportunities of Al.

3. Policy & Regulation: Adopt balanced, agile, and flexible frameworks that support innovation and mitigate the risks of Al. Review current laws, identify regulatory gaps in relation to Al systems, and address them with targeted amendments.

4. Risk Mitigation:

- Develop an India-specific risk assessment framework that reflects real-world evidence of harm.
- Encourage compliance through voluntary measures supported by techno-legal solutions as appropriate.
- Additional obligations for risk mitigation may apply in specific contexts, for e.g. in relation to sensitive applications or to protect vulnerable groups

5. Accountability:

- Adopt a graded liability system based on the function performed, level of risk, and whether due diligence was observed.
- Applicable laws should be enforced, while guidelines can assist organisations in meeting their obligations Greater transparency is required about how different actors in the Al value chain operate and their compliance with legal obligations.

6. Institutions:

- Adopt a whole of government approach where ministries, sectoral regulators, and other public bodies work together to develop and implement Al governance frameworks.
- An Al Governance Group (AIGG) should be set up, to be supported by a Technology & Policy Expert Committee (TPEC).
- The Al Safety Institute (AlSI) should be resourced to provide technical expertise on trust and safety issues, while sector regulators continue to exercise enforcement powers.

Action Plan

The Action Plan identifies outcomes mapped to short, medium, and long-term timelines.

Timeframe	**Key Priorities**

Short-term	• Establish key governance institutions • Develop India-specific risk frameworks • Adopt voluntary commitments • Suggest legal amendments • Develop clear liability regimes • Expand access to infrastructure Launch awareness programmes • Increase access to Al safety tools
Medium term	• Publish common standards • Amend laws and regulations • Operationalise Al incidents systems • Pilot regulatory sandboxes • Expand integration of DPI with Al
Long-term	• Continue ongoing engagements (capacity building, standard setting, access and adoption, etc.) • Review and update governance frameworks to ensure sustainability of the digital ecosystem. • Draft new laws based on emerging risks and capabilities

Conclusion

India's AI governance path is **people-first** and **risk-based**, anchored in **"Do No Harm."** It relies on **agile, sector-specific updates** to existing laws, prioritises **content authentication** against deepfakes, and operationalises an **India-specific risk framework** with an **incident database**. With **graded liability**, **AIGG–TPEC–AISI** coordination, **subsidised compute/datasets (e.g., AIKosh)**, DPI integration, and **capacity building**, India can scale **trustworthy, inclusive AI** at speed and with accountability.

Question for practice

Examine how India's AI Governance Guidelines aim to balance innovation with accountability while addressing key risks associated with artificial intelligence.

Source: Indian Express

Celebration of India–Bhutan Ties

UPSC Syllabus Topic: GS Paper 2 -International Relations – India and its neighborhood- relations.

Introduction

Prime Minister **Narendra Modi's** visit to **Bhutan** for **Jigme Singye Wangchuck's (previous king) 70th birthday** highlights the depth and continuity of India–Bhutan ties. The relationship has moved from the **1949 Treaty** to the **2007 sovereign-equality framework**, anchored by **hydropower cooperation**, development support, and **trusted security coordination**. Current priorities include **Punatsangchhu II**, evolving **private financing**, and broader links in **connectivity, digital, education**, and culture, while calmly managing **boundary sensitivities**.

Evolution of India–Bhutan Relations

1. From the 1949 treaty to a mature partnership: The 1949 Treaty of Friendship set early rules. Bhutan agreed to be **"guided by India" in external affairs**, while India pledged **non-interference in Bhutan's internal matters**. Over time, nationalism in the Himalayas and shifting power balances made this model unsustainable.

2. Democratic transition and treaty revision in 2007: Under **Jigme Singye Wangchuck**, Bhutan moved towards a **constitutional democracy**. **Jigme Khesar Namgyel Wangchuck** now presides over the democratic system. In **2007**, both sides revised the treaty. They **removed the "guided by India" clause**, affirmed **independence, sovereignty, and territorial integrity**, and pledged **not to let territory be used against the other**. **This created sovereign equality with close cooperation.**

3. Leadership maturity and strategic restraint: Leaders in both capitals showed **pragmatism and restraint**. India helped Bhutan **build institutions, train armed forces, and develop the economy**. New Delhi learned to avoid a heavy-handed approach. **Hydropower cooperation since the 1960s** became the **central pillar** of growth and a symbol of mutual benefit.

4. Stabilising leadership and security cooperation:

- **Jigme Singye Wangchuck** managed profound regional shifts during his reign (1972–2006). His guidance continues, as king **Jigme Khesar Namgyel Wangchuck** consults him on national security.
- In **Operation All Clear (December 2003)**, the **Royal Bhutan Army** expelled Indian insurgent groups from Bhutanese jungles; India acted on its side of the border. **This built deep security trust.**

Various Areas of Cooperation

1. **Hydropower as the anchor: Punatsangchhu II (1,020 MW)** is a new milestone. It was built through **government-to-government cooperation**, with India providing initial capital to be repaid from power sales to India at **competitive, periodically adjusted rates**. **This model lifted Bhutan's revenues and incomes.**

2. Evolving financing and private participation: Both sides now plan to **tap private capital** for future projects. **Tata Power and Adani Power** have taken up identified projects with Bhutanese partners. **This diversifies funding and quickens implementation.**

3.Trade & Economic Cooperation:

• **Duty-Free Access:** Bhutan enjoys free trade access to the Indian market for most of its exports.

• **Development Assistance:** India is Bhutan's largest development partner. The Government of India provides significant financial grants and support for Bhutan's Five-Year Plans, funding critical sectors like education, health, and infrastructure development.

• **Currency Stability:** The Indian Rupee (INR) is fully convertible with the Bhutanese Ngultrum (BTN), and India extends currency swap arrangements to Bhutan, ensuring financial stability during economic fluctuations.

4.Security & Strategic Cooperation:

• **Border Security:** India is responsible for training the Royal Bhutan Army (RBA). The RBA and Indian forces cooperate closely on border management.

• **Doklam Standoff (2017):** When the Chinese military attempted to build a road on the disputed Doklam plateau (claimed by Bhutan), Indian forces intervened based on the strategic implications for India's own security (Siliguri Corridor or 'Chicken's Neck'). India's intervention demonstrated its commitment to Bhutan's territorial integrity.

5. Connectivity, digital, and education links: Ties now include **cross-border railway plans**, **digital initiatives**, and **educational cooperation**. The **exposition of Buddha relics from Piprahwa in Bhutan** reflects **enduring spiritual bonds** that reinforce societal trust.

Major Concerns Related to India–Bhutan Bilateral Relations

1. Managing the China factor: China's rise reshapes the Himalayan landscape. Bhutan shares a **long, disputed border** with China and holds **regular consultations** to resolve it. **Doklam remains sensitive.** Bhutan seeks a **peaceful settlement** that **protects Bhutan's sovereignty** and **does not compromise India's vital security interests**.

2. **Navigating asymmetry without mistrust:** The two countries differ greatly in **size and power**. The challenge is to **sustain equality in practice** while expanding cooperation. Past experience shows that **transparency, local priorities, and mutually beneficial security cooperation** prevent friction.

3. Diversifying an economy: Hydropower revenues are a strength, yet **over-reliance can be a risk**. Bhutan pursues **economic diversification** and a **wider international profile**, cultivating partners like **Japan, South Korea, and European nations**, while **deepening** ties with India.

4. Connectivity & Infrastructure Gaps:

• Road, rail, and transport links between India and Bhutan remain limited, hampering further economic and strategic integration.

• Bhutan's reservations about joining the BBIN Motor Vehicles Agreement due to sustainability and environmental concerns have slowed regional connectivity initiatives.

5. **The "Big Brother" Syndrome:** Due to India's overwhelming size and historical role as protector, there is a persistent public sentiment (though small) in Bhutan that views India as overly dominant or a "Big Brother."

6. **Environmental & Social Sensitivities:** Bhutan's focus on Gross National Happiness and environmental preservation sometimes clashes with India's infrastructure-led approach (e.g., highways, hydropower, BBIN MVA). There are concerns about the potential social impacts of rapid integration, such as migration and cultural change.

7. **Border Management & Security:** While the 699 km India-Bhutan border is largely peaceful, incidents of illegal crossings, militant hideouts, and smuggling necessitate close security cooperation.

Way Forward

1. Keep the 2007 treaty spirit central: Sustain **sovereign equality, non-interference, and mutual security assurances**. These norms protect trust as the regional environment shifts.

2. **Deepen balanced growth:** Advance **new hydropower projects** with **mixed financing**, strengthen **grid integration**, and pair energy with **infrastructure, digital public goods, skills, and heritage conservation**. **This reduces concentration risk** and **widens Bhutan's revenue base**.

3. **Institutionalise quiet security coordination:** Maintain **regular joint assessments** on border issues and **capacity-building** for the **Royal Bhutan Army**. Keep **crisis-prevention mechanisms** active, especially around **Doklam**. **Security cooperation should remain demand-driven and mutually agreed.**

4. Strengthen people-centric linkages: Expand **education exchanges, cultural circuits, and connectivity** that bring **direct benefits to citizens**. Such links reinforce resilience against external shocks.

Conclusion

India–Bhutan ties rest on **sovereign equality**, **shared security**, and **developmental partnership**. Hydropower remains the anchor, with diversification, people-centric links, and quiet coordination on the China frontier sustaining trust. With steady leadership and calibrated financing, the partnership can deepen resilience, manage risks, and deliver **mutual prosperity** without friction.

For detailed information on **India-Bhutan Relationship – Significance & Challenges** read this article here

Question for practice:

Discuss how India–Bhutan relations have evolved over time and identify the key areas of cooperation and emerging challenges in the current regional context.

Source: The Hindu

R&D: A public & private challenge

Source: The post **"R&D: A public & private challenge"** has been created, based on **"R&D: A public & private challenge"** published in "Indian Express" on 11th November 2025.

UPSC Syllabus: GS Paper 3 – Indian Economy

Context: Research and Development (R&D) is the backbone of innovation, economic growth, and technological self-reliance. However, India's **Gross Expenditure on R&D (GERD)** as a share of GDP has **stagnated around 0.7% for three decades**, far below the **OECD average of 2.7%**, **South Korea's 4.9%**, **Japan's 3.4%**, and **China's 2.8%**. This low investment threatens India's scientific competitiveness and its goal of achieving *Atmanirbhar Bharat*.

Current Scenario

- **Public dominance:** Around **58–60% of India's GERD** comes from government sectors like defence, space, and atomic energy.
- **University sector:** Despite having **over 1,100 universities and 48,000 colleges**, it contributes only **7% of GERD**, even though it produces more than half of the country's scientific papers.
- **Private sector:** Public companies contribute barely **4%**, and large private firms invest minimally — Infosys (~1% of turnover), Wipro (0.65%), L&T (0.13%), Vedanta (0.02%), and Reliance (0.6%).
- **Global comparison:** In developed economies, the **private sector invests 1.5–3% of GDP** in R&D, but in India, it's barely **0.3%**.

Government Efforts

Successive governments have aimed to raise GERD to **2% of GDP**, linking R&D with the goal of technological sovereignty.
Key initiatives include:

1. **National Missions** in critical sectors — AI, green hydrogen, semiconductors, electric mobility, quantum computing, biopharma, and ocean research.
2. **Anusandhan National Research Foundation (NRF):** Aims to expand private participation, with **70% of its ₹1.4 lakh crore budget** expected from private investors.
3. **Research and Development Innovation Scheme** and **Vigyan Bhara** for capacity building.
4. Integration of R&D in **Production-Linked Incentive (PLI)** schemes and structural reforms aligned with *Atmanirbhar S&T* policies.

Challenges in R&D Investment

1. **Low private sector participation:** Major Indian firms underinvest compared to global peers; only **2% of listed firms** qualify as R&D-intensive.
2. **Limited academic research funding:** Universities receive minimal support despite producing significant research output.
3. **Over-concentration in strategic sectors:** Around 60% of R&D spending goes to defence, space, and atomic energy, leaving limited support for civilian innovation.
4. **Weak innovation culture:** Poor collaboration among academia, industry, and government reduces innovation translation.
5. **Policy gaps:** Lack of a robust mechanism to verify claims under tax incentives for in-house R&D.

6. **Insufficient coordination:** Institutions like **CSIR** have limited regional engagement with small and medium enterprises (SMEs).
7. **Dependence on public funding:** New missions rely on private participation that may not materialize as expected.

Way Forward

1. **Strengthen private sector role:** Encourage industrial R&D through fiscal incentives, competitive grants, and recognition mechanisms.
2. **Expand university-industry collaboration:** Increase funding to universities and foster innovation clusters linked to local industries.
3. **Reform CSIR and create regional R&D hubs** to coordinate with MSMEs and support technology diffusion.
4. **Institutionalise accountability:** Ensure proper monitoring of R&D tax incentives and outcomes.
5. **Adopt global best practices:** Learn from **South Korea's R&D–industry partnerships** and innovation-driven ecosystems.
6. **Enhance public spending:** Increase government GERD to **at least 1.5–2% of GDP** in the next three years to attract matching private investment.
7. **Encourage frontier research:** Support national missions in AI, quantum, semiconductors, and biopharma with clear timelines and deliverables.

Conclusion: India's aspiration to become a global innovation hub and achieve *strategic autonomy* depends on transforming its R&D ecosystem. While public investment provides a strong foundation, **private participation, academic collaboration, and effective policy implementation** are essential. Raising R&D spending to **2% of GDP** and ensuring balanced public-private contribution will not only boost economic resilience but also secure India's technological future amid rising global uncertainties.

Question: Why is India's investment in Research and Development (R&D) low? Suggest measures to boost private sector participation and strengthen the R&D ecosystem.

Role of a Pay Commission in India

Source: The post **"Role of a Pay Commission in India"** has been created, based on **"What is the role of a pay commission?"** published in "The Hindu" on 11th November 2025.

UPSC Syllabus: GS Paper 2 – Governance

Context: A **Pay Commission** is established by the Government of India through an executive order to review and recommend changes in the salary structure, allowances, and service conditions of Central government employees, including defence personnel. The **first Central Pay Commission (CPC)** was set up in **1946**, and since then, seven commissions have submitted their reports. The **8th CPC**, chaired by **Justice Ranjana Prakash Desai**, has recently been constituted and is expected to submit its report within 18 months.

Objectives of the Pay Commission

1. **Rationalising Pay and Allowances:** To revise the pay structure, retirement benefits, and allowances of Central government employees in line with inflation, living costs, and economic growth.
2. **Ensuring Pay Equity:** To maintain internal parity among different levels of employees and achieve external parity with the private sector, promoting fairness across hierarchies.

3. **Fiscal Responsibility:** To balance salary hikes with the government's financial capacity, ensuring that wage bills remain within sustainable limits.
4. **Enhancing Administrative Efficiency:** To create incentives that improve motivation, productivity, and accountability within the public sector.

Terms of Reference (ToR)

The **ToR**, finalised by the Union Cabinet, guide the functioning of each Pay Commission. The major terms include:

- Comparison of public sector pay with private sector compensation.
- Assessment of the economic situation and fiscal prudence.
- Ensuring adequate resources for welfare measures and pension obligations.
- Recommendations on non-contributory pension schemes.
- Consideration of allowances and benefits for employees across departments.
- Study of working conditions and job satisfaction factors such as training, promotions, and work environment.

Role and Importance of Pay Commissions

1. Standardising Compensation: Pay Commissions ensure uniformity in pay scales and service conditions across departments and cadres, avoiding disparities and anomalies.

2. Maintaining Competitiveness: The commissions review the **pay compression ratio**—the ratio between the lowest and highest salaries—to keep government jobs competitive with the private sector. The **7th CPC** fixed this ratio at **1:12.5**, though higher-level specialists often earn more in private roles, necessitating periodic review.

3. Supporting Employee Welfare: Recommendations extend beyond pay to include **housing, health, training, and work-life balance**, improving morale and retention.

4. Fiscal Prudence and Economic Stability: Each CPC carefully evaluates the fiscal impact of its recommendations to prevent undue strain on public finances. The **8th CPC**, for instance, must assess the ₹3.94 lakh crore central wage bill and its impact on the overall expenditure of ₹27.6 lakh crore.

5. Promoting Modern HR Practices: Newer commissions also advocate performance-linked incentives, learning opportunities, and flexible work conditions — aligning public sector management with global best practices.

Challenges in Implementation

- **Heavy Fiscal Burden:** Large salary and pension outlays can strain government budgets.
- **Centre-State Disparities:** State governments often face difficulty in adopting central pay revisions.
- **Limited Performance Linkage:** Pay revisions are often uniform and not directly tied to productivity or merit.
- **Need for Continuous Review:** Long gaps between commissions can delay necessary adjustments in real wages.

Recent Developments – The 8th Central Pay Commission

- **Chairperson:** Justice Ranjana Prakash Desai.
- **Members:** Faculty from IIM Bangalore and senior government officials.
- **Focus Areas:**
    - Revisiting pay compression ratios.
    - Reviewing non-contributory pension schemes.
    - Ensuring adequate funds for welfare measures.
    - Considering modern HR reforms like flexible working and health promotion.
- **Expected Outcome:** Recommendations that align compensation with efficiency, equity, and fiscal responsibility.

Conclusion: The **Pay Commissions** serve as a vital mechanism for balancing **employee welfare, administrative efficiency, and fiscal prudence** in India's governance system. As India's economy and workforce evolve, the **8th CPC** holds the responsibility to modernize public sector compensation — ensuring that government service remains attractive, efficient, and financially sustainable. A well-calibrated and equitable approach will help maintain the delicate balance between public welfare and fiscal discipline.

Question: Discuss the role and significance of Pay Commissions in India. How do they balance public sector equity, efficiency, and fiscal prudence? Illustrate with reference to the 8th Central Pay Commission.

Lacunae in India's Labour Policy

Introduction

Across many sectors, workers face unstable jobs, reclassification, and lost benefits. Informality is widespread. Forced and coercive work still exists. The draft **Shram Shakti Niti 2025** promises a fair, inclusive, and future-ready system. It links social security, safety, skills, and digital tools. The real question is delivery: will protections reach informal, gig, and low-literacy workers, or stay on dashboards? The answer depends on funding, enforcement, and worker voice.

Current Status of India's Labour Force

• **About 90% of workers are informally employed (2024 ILO).**

• **Around 11 million people live in modern slavery** in India.

• **Female labour force participation is 33.7%**, with a **target of 35% by 2030**.

• **12 million** workers are in gig work. **Around 400 million** workers are in the informal economy.

• **Skills–jobs alignment**: **Graduate-job mismatch is 91.75%**.

• **Digital access constraint:** Low household literacy (about **38%**, as stated) limits the access to digital systems.

Constitutional Provisions for Labour Protection

Fundamental Rights

Article 19(1)(c): Guarantees the right to form associations and unions, which includes the right to form trade unions.

Article 21: The "Right to Life" has been interpreted by the courts to include the right to a dignified life, which encompasses a safe working environment, fair wages, and the right to a livelihood.

Article 23: Prohibits traffic in human beings and forced labor, ensuring that no individual can be forced to work against their will or in conditions that violate their dignity.

Article 24: Prohibits the employment of children below the age of 14 in factories, mines, or any other hazardous employment.

Article 17: Prohibits untouchability, which helps protect workers from discrimination and exploitation based on caste, particularly those from Scheduled Castes and Tribes.

Directive Principles of State Policy

Article 38: Mandates the state to promote the welfare of the people by securing and protecting a social order in which justice, social, economic, and political, shall inform all the institutions of the national life.

Article 39: Lays down certain principles to be followed by the state, including:

(a) That citizens, men and women equally, have the right to an adequate means of livelihood.

(d) Equal pay for equal work for both men and women.

Article 41: Guarantees the right to work, to education, and to public assistance in certain cases like unemployment, old age, sickness, and disablement.

Article 42: Directs the state to make provisions for just and humane conditions of work and for maternity relief.

Article 43: Aims to secure a living wage for all workers.

Article 43A: Provides for the participation of workers in the management of industries.

Draft Shram Shakti Niti 2025 (National Labour & Employment Policy)

It is national labour and employment policy that seeks a "fair, inclusive, and future-ready labour ecosystem," aligning constitutional guarantees with a changing world of work.

Key features

1. **Universal Social Security Coverage**

It proposes a **portable Universal Social Security Account** that merges the Employees' Provident Fund Organisation (EPFO), Employees' State Insurance Corporation (ESIC), Pradhan Mantri Jan Arogya Yojana (PM-

JAY), the e-SHRAM platform and State boards so that a worker's health, pension, maternity, accident and life-insurance benefits travel across jobs and sectors.

2. **Employment Facilitation & Future Readiness**
The policy envisions the Ministry acting as an **employment facilitator**, using the National Career Service (NCS) as a **Digital Public Infrastructure (DPI)** for job-matching, credential verification and skill-alignment across Tier-II/III cities and MSMEs, blending skill development with employment.

3. **Occupational Safety, Health & Humane Working Conditions**
It commits to the full enforcement of the Occupational Safety, Health and Working Conditions Code, 2020, with risk-based audits, gender-sensitive standards, and the ambition of "near-zero fatalities by 2047", aligned with ILO standards.

4. **Women's & Youth Empowerment**
It sets a target for **female labour force participation** of 35 % by 2030, up from 33.7 %. Initiatives include affordable childcare, flexible gig work options, equal pay, and apprenticeships. It also emphasises youth entrepreneurship, credential recognition and tackling a 91.75% graduate-job mismatch.

5. **Technology, Green Jobs & Just Transition**
The policy promotes green-technology employment, reskilling of workers (for example those in coal sectors), AI-enabled workplace safety, and climate-aligned labour transitions under SDG 13. It opens paths to "just transition" for affected workers.

6. **Ease of Compliance & Formalisation**
It introduces a single-window, digital compliance architecture for MSMEs, a unified labour-&-employment stack, and aims to increase formalisation of the labour market, simplify registration and strengthen inspections.

7. **Governance & Data-Driven Monitoring**
The policy includes the creation of a **Labour & Employment Policy Evaluation Index (LPEI)**, real-time dashboards, an Annual National Labour Report, and the linking of policy implementation with the digital agenda (Digital India, NEP etc.). This aims for transparency, tracking and continuous improvement.

Concerns Related to National Labour and Employment Policy of India

1. **Employer-ease policy**: Policies prioritise employer convenience over worker rights. This undercuts Articles 14, 16, and 23 and normalises informality. For example ,Workers recruited with ESI and PF promises are later reclassified as "daily wagers," losing contributions.

2 **Unfunded social security architecture:** The proposed **Universal Social Security Account** has **no clear funding** path. There are **no mandates on gig employers** or matching contributions from States. Without money in the system, portability becomes a promise on paper.

3. Digital-first design that excludes: A **digital-ID heavy approach** sidelines workers with **low literacy and limited access**. Women, seniors, and low-literates are most at risk. **Offline access and assisted enrolment** are not hard-wired, so exclusion persists.

4. Weak safety enforcement and soft targets: The pledge of **"near-zero fatalities by 2047"** lacks **penalties, inspectors, and timelines**. Risk audits and gender-sensitive standards are announced, but **without enforcement muscle** they do not change conditions on shop floors.

5. AI-led placement without bias guardrails: Turning the Ministry into an **AI-based employment facilitator** without **bias safeguards** risks **caste and gender discrimination**. Algorithms for job matching and credential checks need **ethics audits and worker oversight**; today, these are missing.

6. Gig work outside wage protection: "Flexibility" is used to **avoid wage floors and benefits**. **Wages Code minima are not applied** to gig workers, and **transition benefits are unclear**. This keeps a large, growing segment **precarious and voiceless**.

7. **Women's participation: targets without tools:** The **35% FLFP by 2030** target is paired with childcare and apprenticeships, but **no quotas, penalties, or robust maternity support** for informal workers. Without enforceable instruments, progress will be **nominal**.

8. **Data rights and surveillance risks:** Dashboards, LEPEI-style indexing and interoperable registries advance **data-driven control** while **DPDP enforcement** is weak. This raises **surveillance concerns** and can chill **Article 19** freedoms in hiring, organising, and grievance processes.

Way forward

1. **Fund universal social security:** Mandate platform-employer and State contributions. Create a tripartite fund so benefits under the unified account are actually paid.

2. **Enforce safety:** Notify penalties, strengthen inspectors, and set time-bound safety milestones while implementing the OSH Code with risk-based audits.

3. **Guarantee offline and assisted access:** Provide walk-in/assisted services at district centres and mobile camps so low-literacy workers, women, and seniors can enrol and use benefits.

4. **Protect gig and platform workers' pay and continuity:** Apply wage floors to platform work and define transition benefits (injury, sickness, downtime) within the unified social security design.

5. **Make AI job-matching fair and auditable:** Require bias testing, independent audits, and a clear appeals path for NCS decisions to prevent caste- or gender-based exclusion.

6. **Restore worker voice and speedy grievance redress:** Formalise union/worker participation in policy pilots and audits, and run time-bound grievance systems with public tracking of outcomes.

Conclusion

The draft brings social security, safety, skills, and data onto one platform. Outcomes now depend on **money, penalties, offline access, fair algorithms, just-transition income support, and worker voice**. With these in place, delivery is possible. Without them, dashboards will grow—but workers will not be safer, formal, or secure.

Question for practice:

Examine the key challenges in implementing the Draft Shram Shakti Niti 2025 as an inclusive and enforceable labour policy for India's informal and gig workforce.

Source: The Hindu

Perils of Easy Credit Access

Source: The post **"Perils of Easy Credit Access"** has been created, based on **"Perils of Easy Credit Access"** published in "The Hindu Businessline" on 12th November 2025.

UPSC Syllabus: GS Paper -3- Economy

Context: Easy credit access has become a hallmark of modern finance, with banks, NBFCs, and fintech companies offering loans at the tap of a screen. While such access helps individuals meet their lifestyle and financial goals, it also increases the risk of over-borrowing, defaults, and long-term financial instability. Therefore, maintaining financial prudence and credit discipline is essential for sustainable borrowing.

Nature and Scope of Consumer Loans

1. Consumer loans include home loans, education loans, vehicle loans, and personal loans for various lifestyle and household expenses.
2. Unsecured loans such as credit cards, buy-now-pay-later schemes, and payday advances do not require collateral, making them more accessible but riskier.
3. These loans enhance consumer purchasing power, support family welfare, and contribute to economic growth through higher consumption.
4. Since unsecured loans are riskier for lenders, they often carry higher interest rates and stricter credit score requirements.

Trends in Consumer Lending

1. The total outstanding consumer loans increased from ₹49.34 trillion in September 2023 to ₹62.54 trillion in September 2025, accounting for nearly 33% of total bank credit.
2. Unsecured loans such as credit card dues and personal loans rose from ₹23 trillion to ₹30 trillion during the same period.
3. To address the rising default risk, the RBI increased the risk weight for unsecured loans from 100 to 125 in November 2023.
4. Non-Bank Financial Companies (NBFCs) and fintech firms now serve around 34–37% of bank borrowers, with over 10 crore personal loans disbursed through digital platforms by FY 2024–25.
5. This expansion has been largely driven by mobile applications and digital lending platforms offering quick and paperless approvals.

Seamless Access through Digital Platforms

1. Over 1,500 RBI-approved digital lending applications now provide instant loan approvals, sometimes within minutes.
2. Digital verification systems using PAN, Aadhaar, and credit scores have made the lending process extremely fast and user-friendly.
3. Many fintech companies use targeted digital marketing and promotional offers to attract borrowers, especially young consumers.

4. These platforms enable borrowing without physical documentation, but they also increase the temptation for impulsive financial decisions.
5. Credit Information Companies (CIBIL, CRIF, Experian, etc.) continuously update borrowers' repayment history, allowing lenders to assess risk profiles more accurately.

Importance of Credit Discipline

1. Borrowers must ensure that the amount borrowed matches their actual repayment capacity to avoid falling into a debt trap.
2. Regular and timely repayment of EMIs helps maintain a healthy credit score, which is essential for future borrowing.
3. Maintaining a balanced mix of secured and unsecured credit reduces overall financial risk.
4. Borrowers should avoid multiple loans from different digital platforms simultaneously, as this increases repayment complexity.
5. Understanding the terms of credit, such as interest rates, processing fees, and prepayment penalties, is vital before taking any loan.
6. Financial literacy programs should be promoted to help borrowers understand the long-term impact of unsecured loans.

Challenges of Easy Credit Access

1. **Rising Household Debt:** Many borrowers take multiple unsecured loans without fully understanding their repayment obligations, leading to financial stress.
2. **Over-Leveraging:** Easy access to credit encourages overspending, making households vulnerable to defaults and legal consequences.
3. **High Cost of Credit:** Unsecured loans carry higher interest rates and penalty charges, which can escalate the debt burden.
4. **Data Privacy Concerns:** The digital lending ecosystem often involves third-party data sharing, which poses privacy and misuse risks.
5. **Regulatory Challenges:** The speed of fintech innovation sometimes outpaces regulation, leading to unmonitored or predatory lending practices.
6. **Psychological Pressure:** Defaults or overdues may lead to harassment by recovery agents and cause emotional distress to borrowers.

Way Forward

For Borrowers

1. Borrowers should exercise financial prudence by borrowing only for productive or essential needs.
2. They should regularly check their credit reports and maintain transparency in financial transactions.
3. Financial planning and budgeting should be integral before taking any new credit.

For Lenders

1. Lenders must follow responsible lending norms, ensuring that loans are extended only to creditworthy borrowers.
2. Transparency in loan agreements, interest computation, and repayment terms should be mandatory.

3. Lenders should use technology responsibly, ensuring data security and ethical use of borrower information.

For Regulators

1. The RBI should continue monitoring the digital lending ecosystem and enforce strict licensing norms for fintech firms.
2. Regular audits and grievance redressal mechanisms should be strengthened to protect borrowers from exploitation.
3. Financial inclusion policies should focus equally on borrower education and credit awareness, not just loan accessibility.

Conclusion: Easy credit access, while beneficial for financial inclusion and economic growth, also brings significant challenges related to debt sustainability and consumer protection. Borrowers must adopt cautious financial behavior, lenders should prioritize responsible lending, and regulators must ensure effective oversight. A balanced approach among all stakeholders will help ensure that credit accessibility empowers rather than endangers financial well-being.

Question: Easy access to consumer credit has become a double-edged sword in the Indian economy. Discuss the benefits and risks associated with the growing trend of unsecured and digital lending.

Govt Plans Major Overhaul for Index of Industrial Production (IIP)

Source: The post **"Govt Plans Major Overhaul for Index of Industrial Production (IIP) "** has been created, based on **"Govt Plans Major Overhaul for Index of Industrial Production (IIP)"** published in "Indian Express" on 12th November 2025.

UPSC Syllabus: GS Paper -3- Economy

Context: The **Index of Industrial Production (IIP)** is a crucial indicator that measures the short-term changes in the volume of production of industrial goods. It reflects the health of India's industrial sector and serves as a key input for policy formulation. Recently, the **Ministry of Statistics and Programme Implementation (MoSPI)** proposed revising the methodology of IIP calculation, including the **substitution of closed factories** and updating the **base year to 2022–23**, to make it more robust and representative of current industrial realities.

Need for Revision in IIP Methodology

1. **Outdated Factory Sample:** Many factories currently included in the IIP are no longer operational or no longer represent actual production levels, leading to inaccurate estimates.
2. **Increased Dependence on Estimations:** The closure or inactivity of listed factories forces reliance on imputation methods, reducing data reliability.
3. **Economic Structural Changes:** India's industrial structure has changed significantly since the last revision in 2017, making it necessary to capture emerging industries and technologies.
4. **Base Year Update:** The previous base year (2011–12) does not reflect the recent industrial and technological developments, warranting a shift to **2022–23** for relevance.
5. **Improved Policy Accuracy:** Policymakers rely on IIP data to assess economic momentum and design interventions; inaccurate data can lead to flawed policy responses.

Process of Substitution of Factories

1. **Selection of Comparable Units:** A factory can be introduced into the IIP sample if it produces the same item or belongs to the same industrial group as the one being replaced.
2. **Comparable Output Value:** The **gross value added** or **gross value of output** of the new factory must be close to that of the one it replaces, ensuring size similarity.
3. **Operational Record:** The new factory must be **operational for at least 12 months** before being included in the IIP sample.
4. **Data Requirement:** Twelve months of production data prior to the substitution are needed for consistency.
5. **Temporary Gaps:** Until overlapping data between the old and new factories are available, "nil" or **imputed values** may be used, which could temporarily affect monthly production figures.

Broader Review of IIP

1. The revision is part of a **comprehensive overhaul** of the IIP system, last updated in **2017**.
2. The new methodology will use **2022–23 as the base year**, with revised numbers expected by **May 2026**.
3. The IIP is based on production data from **14 source agencies**, covering **407 items** across **three major sectors**: **Mining, Manufacturing and Electricity**
4. These items are categorized into **six groups**: Primary goods, Capital goods, Infrastructure/construction goods, Intermediate goods, Consumer durables and Consumer non-durables.
5. The revision aims to make IIP data more reflective of current industrial capacities and product diversity.

Current Industrial Performance (as per latest data)

1. India's **industrial growth rate** as per IIP was **4% in September 2025**.
2. In the first half of **FY 2025–26**, industrial output grew by **3%**, compared to **4.1%** in the same period of **FY 2024–25**.
3. The upcoming revision is expected to improve accuracy and reduce estimation errors in such performance reporting.

Significance of the Revision

1. **Enhanced Accuracy:** Replacing defunct factories ensures that IIP data reflects real-time production activity.
2. **Policy Relevance:** Reliable industrial data helps policymakers, the RBI, and analysts track growth trends and design interventions.
3. **Reduced Dependence on Estimation:** Substitution minimizes imputed data use, improving the reliability of official statistics.
4. **Updated Industrial Representation:** The new base year captures structural shifts such as digital manufacturing, green technologies, and new production processes.
5. **Greater Transparency and Robustness:** The feedback-based approach ensures that the final methodology is **"well-informed, robust, and broadly supported."**

Challenges in Implementation

1. **Data Collection Delays:** Ensuring uniform and timely reporting from new factories may pose logistical difficulties.
2. **Transitional Data Gaps:** Temporary "nil" or imputed data may distort short-term industrial growth estimates.
3. **Coordination with Source Agencies:** Synchronizing data across 14 agencies requires strong institutional coordination.
4. **Industrial Volatility:** Rapid entry and exit of manufacturing units can complicate the sample's stability.

Way Forward

1. **Strengthen Data Infrastructure:** Enhance digital data collection systems for real-time industrial reporting.
2. **Regular Methodological Reviews:** Conduct periodic updates to prevent large data gaps between revisions.
3. **Stakeholder Consultation:** Continue engaging with industry associations, economists, and statisticians for transparent methodology design.
4. **Integration with Other Indices:** Align IIP updates with GDP and CPI revisions to maintain consistency in economic analysis.
5. **Capacity Building:** Improve the technical capability of statistical staff and data collection agencies to ensure uniform data quality.

Conclusion: The proposed revision of the IIP methodology marks an important step toward ensuring **accuracy, credibility, and contemporaneity** in industrial data. By replacing outdated factory samples and updating the base year to 2022–23, MoSPI aims to create a more **robust and policy-relevant indicator** of India's industrial health. However, timely implementation, data quality assurance, and effective coordination among agencies will be key to the success of this reform.

Question: The Ministry of Statistics and Programme Implementation (MoSPI) has proposed changes in the methodology of calculating the Index of Industrial Production (IIP). Discuss the need, process, and significance of this revision.

AI Labelling Regulations Framework

UPSC Syllabus Topic: GS Paper3- Awareness in the fields of IT, Space, Computers, robotics, nano-technology, bio-technology

Introduction

Near-perfect AI videos and audio now appear next to real content, so users struggle to trust what they see and hear. A deepfake of the Finance Minister promoting an investment scheme and causing a large financial loss shows how **synthetic media can directly harm citizens.** To respond, India has proposed an AI labelling framework under the IT Rules 2021, focusing on clear labels, duties for large platforms, better detection tools and graded responsibilities for creators**.**

What is synthetic media?

Synthetic media is content that is artificially or algorithmically created, modified, or generated to appear authentic. It includes digital material reshaped by software in images, audio or video, even when it is

not produced by generative AI. Content may be **fully AI-generated, AI-assisted or AI-altered**, including mixed media such as real visuals with cloned audio.

Over 50% of all content on the Internet is now considered AI-generated. This huge volume makes it hard for platforms and users to pick out content that is dangerous or misleading.

Concern Related to Synthetic Media

1. **Misinformation and Disinformation:** A major concern is the potential for synthetic media to spread fake news, create false narratives, and manipulate public opinion. This can impact political campaigns, disrupt democratic processes, and erode public trust in news organizations and government institutions.

2. Difficulty of user detection: Many synthetic videos and audio clips now look and sound almost real. Some still show visible signs of editing, but others are so realistic that viewers cannot clearly distinguish them from authentic content.

3. **Privacy and Consent Violations:** Synthetic media tools allow for the use of individuals' likenesses, voices, and behaviors without their consent. This has led to an increase in non-consensual intimate imagery (deepfake pornography), identity theft, and online harassment, causing significant psychological and reputational harm to victims.

4. **Fraud and Financial Crime:** Deepfake audio and video can be used in social engineering attacks to impersonate individuals (such as a CEO or bank employee) and deceive others into transferring money or divulging sensitive information.

5. **Erosion of Trust and Authenticity:** The prevalence of convincing synthetic content blurs the line between reality and fabrication, leading to a general skepticism towards digital media. This "authenticity crisis" makes it harder to use authentic media as reliable evidence in legal or journalistic contexts.

6. **Intellectual Property Issues:** The use of copyrighted material to train AI models and the generation of content that may infringe on existing works raise complex legal challenges regarding ownership and originality.

7. **National Security Risks:** Malicious state or non-state actors may use synthetic media for information warfare, psychological operations, or to sow discord and destabilize trust in targeted nations.

Regulating Mechanism (Draft Amendments to the IT Rule 2021)

The government earlier treated the existing framework as adequate to deal with synthetic media. **It has now proposed draft amendments to the Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules, 2021.** The aim is to create a clear **AI labelling framework.**

Key provisions of the draft amendments to the IT Rule 2021

1. **Enhanced Obligations for significant social media intermediaries (SSMIs) -Requires SSMIs to:**

- Obtain a **user declaration** on whether uploaded information is synthetically generated;
- Deploy **reasonable and proportionate technical measures to verify** such declarations;
- Ensure that synthetically generated information is **clearly labelled or accompanied** by a notice indicating the same; and

- The **label or identifier must enable immediate identification of the content** as synthetically generated information.
- The rule further **prohibits intermediaries from modifying, suppressing, or removing** such labels or identifiers.

2. Minimum label size and duration: The draft requires that labels cover **at least 10% of the visual area of synthetic videos**. For audio, labels must cover **at least 10% of the initial duration of synthetic clips**. This tries to ensure that the label is prominent and not hidden like fine print.

3. **Due diligence focused on large platforms:** The primary obligations fall on **Significant Social Media Intermediaries**, which host large user bases and can amplify harmful synthetic media at scale. This reflects the view that bigger platforms carry higher responsibility.

Major Concerns Related to The Draft Amendments to the IT Rule 2021

1. **Broad and unclear scope of synthetic media:** The definition of synthetic media covers any content that is artificially or algorithmically created or modified. This makes it hard to separate everyday edits or computer-generated imagery from content that is actually harmful or misleading, even though **not all synthetic media is problematic.**

2. **Rigid 10% labelling rule may not work in practice:** The rule that labels must cover **10% of the visual area or 10% of the initial audio duration** may not meet the **reasonable person test.** Short disclaimers in longer clips can be ignored like fine print, and long disclaimers may overwhelm users instead of helping them.

3. **Unclear treatment of mixed media formats:** The framework does not clearly deal with **mixed media**, such as real visuals combined with cloned or synthetic audio. It is not clear how the 10% rule will apply in such cases, which creates confusion for both platforms and creators.

4. **Unreliable technical markers like watermarks: Watermarks added by AI companies are easy to remove.** Soon after a major text-to-video tool promised watermarking of synthetic videos, other tools appeared that could wipe these markings. This makes sole reliance on watermarks a weak safeguard.

5. **Limited effectiveness of current detection and labelling tools:** Synthetic media is multiplying faster than verification tools can keep up. Platforms face difficulty in detecting AI-generated or algorithmically created content, and **third-party detection tools are only as good as their training and accuracy.** An audit of 516 AI-generated posts found that **only 30% were correctly flagged**, and even the best-performing platform labelled just about **55%** of such content.

6. **Gaps in content provenance and platform practices**
Many platforms follow **Coalition for Content Provenance and Authenticity** (**C2PA) standards** to track content origin, but these standards do not always result in consistent labelling.

Way forward

1. Fine-tune categories and standards:,Develop **clear, precise standards for different types of synthetic media**. Use a **tiered labelling system** that separates **fully AI-generated, AI-assisted and AI-altered content**, instead of relying on one generic label.

2. **Extend duties to influential creators:** Make **creators above a certain follower threshold disclose their use of AI** in content creation. Encourage **voluntary self-labelling** among smaller creators to build a basic culture of transparency.

3. **Adopt graded compliance:** Link **stricter obligations to higher reach and influence**. Professional creators and big accounts should follow stronger labelling and disclosure norms to **maintain public trust** and adapt to changing regulation.

4. **Improve detection systems with external tools:** Strengthen platform capacity to identify synthetic media by using **specialised third-party detection tools**, and regularly improve them based on **training quality and accuracy levels**.

5. Use independent auditors for high-risk content: In cases of **harmful, fraudulent or misleading synthetic media**, rely on **independent information verifiers and auditors**.

Conclusion

AI labelling rules are emerging because **synthetic media is widespread, hard to detect and sometimes highly harmful.**Draft IT rules push large platforms to label such content and verify user declarations, while graded compliance can involve creators. As a **multi-stakeholder effort** with stronger standards, tiered labels, better detection tools and support from independent auditors, **users can receive clearer signals on what is real and what is synthetic** and face fewer risks online.

Question for practice:

Examine the effectiveness of India's proposed AI labelling framework in addressing the risks posed by synthetic media.

Source: The Hindu

G2 and India

Introduction

The US–China "G2" dynamic refers to a situation where the US and **China act as the two main centres of** global power. The recent Trump–Xi meeting at the Busan APEC Summit, framed as a "G2", highlighted this reality. **Their strategic calm may reduce global tensions**, but it also **exposes India's limited economic leverage and high external dependence.** This moment forces India to reassess its assumptions about great-power politics and rethink how it positions itself between the two dominant players.

Impacts of US–China "G2" Dynamic on India

1. US priorities: The US now puts its China relationship ahead of ties with India. Trade imbalances and big-ticket deals with Beijing attract more attention in Washington than long-term strategic plans with New Delhi.

2. India's Indo-Pacific assumptions: India earlier believed it was central to the US Indo-Pacific strategy as a counterweight to China. The quick US trade accommodation with China, combined with continued tariff pressure on India, shows these assumptions were over-optimistic.

3. Economic costs and unequal treatment: US tariffs have already cost Indian workers jobs, while China gains relief and praise from Trump. This difference in treatment underlines how India's concerns can be sacrificed when they clash with core US economic interests.

4. Need for strategic rethinking: The "G2" moment signals that India cannot rely on permanent US support. India must rethink how it defines its value to Washington and prepare for frequent policy shifts. Greater flexibility becomes essential.

Way forward

1. From reliance to multi-alignment: India must move faster towards a multi-aligned posture. It should deepen ties with Europe, the UK, Gulf states, Africa, ASEAN, Russia and Central Asia. No single relationship should be able to limit or define India's choices in foreign or economic policy.

2. **Reassessing the Quad and other coalitions:**

- Uncertainty over Trump's participation in the next Quad summit in India shows how fluid coalitions are.

- India should treat the Quad as useful but not central, and weigh it alongside other regional and bilateral forums, including engagement with China when it serves Indian interests.

3. **Managed competition with China:**

- The current **US–China thaw** creates some space for engagement between India and China.

- India needs a model of **managed competition**: firm military preparedness on the border, but open diplomatic and trade channels. This can prevent escalation and keep room for negotiation on difficult issues.

4. **Cutting dependence and building capability:**

- India's reliance on **Chinese imports**, especially in pharmaceuticals and electronics, is a core weakness.

- India must **diversify supply chains**, attract firms that want to reduce exposure to China, and build domestic capacity in **AI, quantum technologies, semiconductors and advanced manufacturing**.

5. **Balancing openness and state-led instruments:**

- Economic policy must be coherent and rooted in political and social realities.

- India should keep trade and investment **open and business-friendly**, but also use targeted **industrial policy, public investment and digital tools** where markets alone cannot protect workers, key sectors or critical technologies.

Conclusion

For India, the "G2" moment is a clear warning. The US will not automatically treat India as a counterweight to China. In a transactional multipolar world, only a proactive, multi-aligned strategy built on economic and technological resilience can reliably safeguard India's interests.

Question for practice:

Examine how the evolving US–China "G2" dynamic challenges India's earlier strategic assumptions and discuss the policy shifts India must pursue in response.

Source: Indian Express

A Case of Privileged Communications

Source: The post **"A Case of Privileged Communications"** has been created, based on **"A Case of Privileged Communications"** published in "The Hindu Businessline" on 13th November 2025.

UPSC Syllabus: GS Paper -2- Polity

Context: The Supreme Court on **October 31, 2025**, reaffirmed the indispensable role of advocates in India's constitutional democracy. It held that **a lawyer cannot be summoned merely to disclose what a client has communicated**, except when such legal advice is used to commit or conceal a crime. The verdict arose from a suo motu case concerning a notice issued under Section 179 of the **Bharatiya Nagarik Suraksha Sanhita (BNSS), 2023**.

What are Privileged Communications?

1. **Privileged communications** are confidential exchanges between certain protected relationships — such as **attorney-client and spouses** — safeguarded from disclosure in court.
2. These are protected under **Sections 126–129 of the Indian Evidence Act, 1872** (now reflected in Sections 128–132 of the BNSS, 2023).
3. Purpose: To build **trust**, **professional integrity**, and ensure **effective legal representation**.

Legal Provisions and Scope

1. **Section 132 BNSS** (earlier Section 126 Evidence Act) prohibits advocates from disclosing communications made in the course of professional engagement, even after the employment ends.
2. Exceptions (where disclosure is permitted):
    a. With the client's consent.
    b. If communication is made to commit or conceal a crime.
    c. If disclosure is required by law or departmental approval for **disciplinary proceedings.**

Supreme Court's Key Observations

1. The **Court asserted** that compelling a lawyer to disclose client communications **violates the citizen's right to fair trial and legal representation**.

2. It held that **State intrusion** into the lawyer-client relationship **endangers the structural integrity** of the justice system.
3. Privilege is not a "shield" for lawyers but a **safeguard for citizens** to ensure effective defence.

4. The privilege **"ensures no prejudice is caused to the accused whom the lawyer represents."**

Why Safeguarding this Privilege is Important

1. It upholds the **right to equality before law and fair trial** under **Articles 14 and 21**.
2. It prevents the State from **coercing confessions indirectly** through lawyers.
3. It encourages **free and honest communication** between lawyers and clients — essential for justice delivery.
4. It also strengthens **public trust** in the legal system.

Lawyer as a Constitutional Actor

1. The Court recognized advocates as **"constitutional actors"**, not mere private agents.
2. Their role is central to the **constitutional architecture of legal representation** and the survival of rule of law.
3. Compelling lawyers to reveal confidential information **collapses the distinction** between defence and prosecution, violating the **principle of fair defence**.

Wider Implications

1. The judgment reinforces earlier rulings such as: *M.H. Hoskot v. State of Maharashtra* (1978) and *Hussainara Khatoon v. State of Bihar* (1980)
affirming the right to effective legal representation as part of **Article 21**.
2. It curtails **investigative overreach**, where police or agencies summon advocates to "assist" investigations by disclosing client details.

Way Forward

1. **Codify clearer safeguards:** Amend the **BNSS and Bar Council Rules** to explicitly reaffirm the inviolability of client-lawyer privilege, defining limited exceptions with judicial oversight.
2. **Strengthen awareness among enforcement agencies:** Conduct **training for police and investigative officers** to prevent misuse of Section 179 BNSS and other provisions against advocates.
3. **Digital confidentiality norms:** Frame **data protection and cyber-ethics guidelines** to secure electronic client communications in the digital age.
4. **Ethics and accountability:** Encourage the **Bar Council** to enforce strict disciplinary action in genuine cases of professional misconduct while upholding the core principle of confidentiality.
5. **Judicial vigilance:** Courts must continue to **scrutinize coercive summons or investigative overreach** that threaten the right to fair defence.

Conclusion: The Supreme Court's judgment strengthens the **constitutional protection of lawyer-client confidentiality**, affirming it as a pillar of **fair trial and rule of law**. By positioning the advocate as a **constitutional actor**, the Court safeguards the citizen's **right to defence, dignity, and privacy**, ensuring that justice in India remains independent, impartial, and constitutionally grounded.

Question: Can lawyers break client confidentiality? Discuss in the context of the recent Supreme Court judgment.

Tackling China's Rare Earth Choke

Source: The post **"Tackling China's Rare Earth Choke"** has been created, based on "Tackling China's Rare Earth Choke" published in "Indian Express" on 13th November 2025.

UPSC Syllabus: GS Paper -3- Economic Development, Science & Technology, Environment, Security

Context: China currently controls around **60–65% of global rare earth production** and almost **90% of global refining capacity**, giving it strategic leverage over critical supply chains. After facing an export ban from China in **2010**, Japan adopted a comprehensive plan to diversify its rare earth sources, develop alternative technologies, and ensure long-term supply security. asure Japan's approach has now become a model for other nations seeking to reduce their dependency on Chinese rare earth supplies.

Background – China's Rare Earth Monopoly

1. In September 2010, a **collision between a Chinese fishing vessel and a Japanese coast guard ship** near the East China Sea led China to **suspend rare earth exports to Japan**.
2. This incident revealed Japan's extreme vulnerability, as it relied on China for nearly **90% of its rare earth imports**.
3. The move demonstrated how China could use its mineral dominance as a **geopolitical weapon**.

Japan's Counter Strategy

1. **Diversification of Supply Sources:** Japan entered into partnerships with **Australia, Vietnam, India, and African nations** to develop alternate mining and processing capabilities.
2. **Government Investment:** The Japanese government agency **JOGMEC (Japan Oil, Gas and Metals National Corporation)** financed overseas mining projects to secure long-term supply.
3. **Recycling and Substitution:** Japan promoted **recycling technologies** and invested heavily in **research to find substitutes** for rare earth elements in manufacturing.
4. **Strategic Stockpiling:** Japan built **national reserves of critical minerals** to prevent disruptions in industrial production.
5. **Public–Private Coordination:** Japan's strategy involved **close coordination between the government, industries, and research institutions**, ensuring policy alignment and effective execution.
6. **International Cooperation:** Japan worked with like-minded countries to promote **transparent and sustainable global supply chains** for rare earths.

Achievements of Japan's Approach

1. Japan successfully reduced its dependence on China for rare earth imports from **about 90% in 2010 to nearly 60% by 2023**.
2. The country invested **over $1 billion in global mining projects** and developed advanced recycling systems.
3. Japanese industries such as **Toyota and Hitachi** began using **rare earth-free or low-use technologies**, minimizing supply risks.
4. Japan's rare earth policy became a benchmark for **strategic self-reliance and industrial resilience**.

Challenges

1. **High Extraction and Refining Costs:** Rare earth processing is expensive and requires advanced technology, making it difficult for many nations to compete with China's low-cost dominance.
2. **Environmental Concerns:** The mining and refining of rare earths produce toxic waste, creating ecological and social challenges that restrict expansion.
3. **Limited Technological Capacity:** Many countries, including India, lack **cutting-edge refining technologies** and face a shortage of skilled technical manpower.
4. **Long Gestation Period:** Developing new mines, processing plants, and recycling networks takes **years of sustained investment**.
5. **Global Market Dependence:** China continues to dominate downstream manufacturing and **price-setting mechanisms**, which discourages competition.
6. **Institutional Hurdles in India:** India's **bureaucratic delays, limited private participation, and outdated mining laws** hinder rapid progress in the rare earth sector.

India's Exposure

1. India imported around **2,270 tonnes of rare earths in 2023–24**, marking a **29% increase** compared to 2019–20.
2. Approximately **65% of India's rare earth imports come from China**, making the country vulnerable to potential supply disruptions.
3. The rapid expansion of **EV, renewable energy, and defense industries** in India will significantly increase demand for rare earths in the coming years.

Way Forward

1. **Diversify Import Sources:** India should expand partnerships with **Australia, Vietnam, the U.S., and African nations** for joint exploration and mining.
2. **Strengthen Domestic Capabilities:** Agencies like **IREL (India) Ltd.** and the **Atomic Minerals Directorate** must be empowered to enhance exploration, processing, and value addition.
3. **Promote Recycling and Urban Mining:** India should establish **e-waste recycling hubs** and promote **rare earth recovery technologies**.
4. **Create Strategic Mineral Reserves:** The government should maintain **national stockpiles** of essential rare earths for critical industries.
5. **Ensure Policy Integration:** Rare earth policy should align with the **National Mineral Policy and Atmanirbhar Bharat** initiatives to promote private sector participation.
6. **Foster International Cooperation:** India can lead a **Rare Earth Partnership Framework** with Quad and ASEAN countries to reduce collective dependence on China.
7. **Invest in R&D:** Long-term investment in **green extraction technologies and RE-free alternatives** should be prioritized.

Conclusion: Japan's rare earth strategy demonstrates that **diversification, innovation, and recycling** can effectively counter resource monopolies. Although challenges remain, Japan's experience proves that **strategic planning, policy consistency, and international cooperation** can ensure mineral security and economic resilience. For India, adopting similar long-term strategies is essential to achieve **technological sovereignty and supply chain independence** in critical minerals.

Question: **How can Japan's strategy to counter China's rare earths dominance serve as a model for other nations, including India? Discuss the challenges involved.**

Antimicrobial Resistance in India

Introduction

Antimicrobial resistance (AMR) is now a serious and escalating threat for India and for the world. The WHO's GLASS 2025 report shows that common bacteria are often resistant to standard antibiotics, and India faces far higher resistance than the global average. GLASS and national data also reveal gaps in surveillance, weak regulation, and slow policy execution. Kerala's stewardship model and newer antibiotics show solutions exist, but India needs stronger, coordinated action on AMR.

About GLASS-2025

Global Antimicrobial Resistance and Use Surveillance System (GLASS) 2025 is the WHO's global platform for tracking antimicrobial resistance using standardised, comparable data.

Launched in **2015**, it publishes annual reports showing resistance trends across major pathogens.

India joined GLASS in 2018 through the NCDC AMR surveillance network.

GLASS collects data on infections, antibiotic use, and laboratory capacity, helping countries compare resistance levels, identify high-risk pathogens, and strengthen national AMR policies and stewardship programmes.

Highlights from GLASS 2025

Global finding

The 2025 report presents an analysis of data from 104 countries and focuses on resistance trends between 2018 and 2023.
AMR was associated with nearly 5 million deaths in 2019 alone.
High Prevalence of Resistance: An average of one in every six laboratory-confirmed bacterial infections recorded in 2023 was found to be resistant to antibiotic treatment.

Significant Resistance Levels: For key pathogen-antibiotic combinations, the report notes alarming resistance levels:

***E. coli* resistance:** Over 60% resistance to ciprofloxacin and around 40% resistance to third-generation cephalosporins.

***K. pneumoniae* resistance:** Nearly 20% resistance to last-resort antibiotics like carbapenems.

***S. aureus* resistance:** About 20% resistance to methicillin (MRSA).

India specific

AMR in India is described as **"a serious and escalating threat."**

In **2023**, **about one in three bacterial infections in India** were resistant to commonly used antibiotics, compared to **about one in six globally**, with **India disproportionately affected**.

Key aggravating factors highlighted for India

- **Widespread over-the-counter access to antibiotics.**
- **Self-medication** with antibiotics.
- **Incomplete antibiotic courses** taken by patients.
- **Environmental contamination** from:
  - Pharmaceutical manufacturing
  - Hospital waste
- **Uneven enforcement of regulations** related to antibiotic use and sale.

Limitations of India's GLASS data

1. Hospital and tertiary-care bias: Most Indian GLASS data comes from NARS-Net labs in tertiary hospitals and medical colleges. This means the picture is driven by serious hospital cases, not everyday infections in primary centres or rural clinics.

2. Under-representation of private and rural sector: NARS-Net sites are mainly public sector medical colleges. Small hospitals, private clinics, and rural laboratories contribute very little data, so rural and peri-urban patterns are not well captured.

3. Limited pathogen and specimen scope: Surveillance includes only seven priority pathogens and five specimen types. Many community-acquired infections and other important bacteria may be missed or under-represented.

Initiatives Taken Against Antimicrobial Resistance (AMR)

1. National Policy and Surveillance

- India has started the **National Programme on AMR Containment**.
- It **enrolled in GLASS (Global antibiotic resistance surveillance report system) in 2017** and participates actively.
- Surveillance networks such as **ICMR's AMRSN / i-AMRSS** and **NCDC's NARS-Net** collect resistance data from sentinel hospital laboratories.
- The **National Action Plan on Antimicrobial Resistance (NAP-AMR)**, launched in 2017, provides an overall policy framework.

2. State-Level Action: Kerala Model

- **Kerala Antimicrobial Resistance Strategic Action Plan** (2018) uses an inter-sectoral **One Health** approach.

- **AMRITH (Antimicrobial Resistance Intervention for Total Health)**, launched in 2024, targets over-the-counter antibiotic sales through inspections, penalties, and public reporting.

- Kerala aims to become **antibiotic-literate by December 2025** through awareness and proper antibiotic use initiatives.

3. Regulatory and One Health Measures

- **Ban on colistin** use as a growth promoter in animal husbandry was imposed in 2019.

- The COVID period strengthened **One Health collaborations** across human, animal, and environmental sectors.

4. Innovation and Industry Efforts

- **CDSCO** has approved four new antibiotics: **Nafithromycin, Plazomicin, cefepime/enmetazobactam, Tedizolid phosphate**.

- The **AMR Industry Alliance** works to speed up discovery and development of new antibiotics and diagnostics, improve equitable access, and promote responsible manufacturing practices.

Way forward

1. Nationwide AMR surveillance : India needs a wider surveillance system that covers tertiary, secondary, and primary healthcare facilities.

2. More laboratories : Including more laboratories and peripheral centres will help generate **representative and reliable resistance data**, instead of estimates driven mostly by tertiary hospitals.

3. Strengthen antibiotic regulation : Strict enforcement of **prescription-only antibiotic sales** is essential. Expanding Kerala's model of inspections, penalties, and public reporting can reduce over-the-counter misuse and promote safer, responsible antibiotic use across States.

4. Improve One Health coordination:

- Human health, animal health, agriculture, and environmental sectors must work together through **strong One Health mechanisms**.

- Better coordination will help control misuse in livestock, reduce environmental contamination, and ensure shared responsibility for stewardship.

5. AMR literacy: Awareness campaigns should make AMR understandable for the general population. Schools, civil society groups, and healthcare providers can support **basic education on bacteria, antibiotic use, and the risks of incomplete treatment**, helping people relate to AMR more closely.

6. Support development and access to new antibiotics: India must encourage innovation through **sustained funding**, better incentives, and faster but safe regulatory pathways. New antibiotics should target priority pathogens, be safe, affordable, and aligned with stewardship principles to ensure long-term effectiveness.

7. Revitalise State Action Plans on AMR: States need renewed commitment to implement their AMR plans. Clear timelines, adequate budgets, and regular progress reviews can help move AMR from paper frameworks to **consistent on-ground action**.

For detailed information on **Increasing Antimicrobial Resistance in India** read this article here

Conclusion

India faces a high AMR burden, incomplete surveillance and weak stewardship, but also has promising models and new antibiotics. Kerala's experience shows that strong regulation, enforcement and literacy can work. India must scale One Health-based State plans, widen AMR surveillance and support affordable innovation to secure effective antibiotics.

Question for practice

Examine how the GLASS 2025 findings on antimicrobial resistance highlight both the scale of India's AMR crisis and the gaps in its surveillance and stewardship efforts.

Source: The Hindu

Shutdown of US Government

Syllabus- GS Paper 2- Effect of policies and politics of developed and developing countries on India's interests

News- US President Donald Trump recently signed a stopgap bill, ending the longest government shutdown in US history. The 43-day shutdown, caused by a budget deadlock between the Executive and Congress, was the 11th since 1976—yet the most prolonged and politically charged of all.

What is a US Government Shutdown?

A government shutdown occurs when the US federal government **loses legal authority to spend money** because Congress fails to pass annual appropriations or a stopgap funding bill by the October 1 fiscal deadline.

Under US law, federal agencies cannot operate or pay employees without approved funding, forcing partial or complete closure of departments.

Why Shutdowns happen in the US (But not in India)

1. Separation of Powers

- The US follows a **presidential system** where the Executive and Legislature are separate and independently elected.
- The President cannot guarantee congressional approval of the budget.
- Failure to pass the budget does **not** lead to the resignation of the government.

2. Legislative Gridlock

- When the two Houses of Congress—especially the Senate—are politically divided, the budget gets delayed.

- Key bills require **60 Senate votes**; inability to reach this threshold triggers deadlock.

3. Policy Conflicts

- Shutdowns often arise due to disagreements on politically sensitive issues.
- In the recent case, disputes over funding for the **Supplemental Nutrition Assistance Program (SNAP)** significantly delayed negotiations.

In Contrast, India

- The Executive is part of Parliament; if the budget fails, the government effectively loses confidence.
- Parliament does not shut down government operations; **vote-on-account** provisions ensure continuity.

How the US Budget Process Works

1. **Fiscal Calendar-** The US fiscal year runs from October 1 to September 30.
2. **Budget Preparation-** By the first Monday of February, the President submits the budget proposal. Committees in the House and Senate then debate, amend, and negotiate its details.
3. **Hard Deadline-** All appropriations must be passed by October 1. If funding lapses, a "funding gap" triggers a government shutdown under the Antideficiency Act.
4. **Temporary Relief-** Congress can pass a Continuing Resolution (CR) to temporarily fund the government, as occurred to end the 43-day shutdown.

Economic and Social Impact of Shutdowns

- **Disrupted Public Services** – Government shutdowns lead to the closure of national parks, furloughs of federal employees, and delays in tax refunds, welfare programmes, and regulatory functions.
- **Economic Loss** – Each shutdown results in billions of dollars in lost productivity, while businesses reliant on federal contracts face uncertainty and cash-flow challenges.
- **Rising Fiscal Stress** – Despite the size of the US economy, the fiscal deficit remains high. For FY2025, the deficit stood at $1.8 trillion, with receipts of $5.2 trillion and spending of $7 trillion. Growing deficits expand public debt and raise interest payments, which constitute the second-largest federal expenditure.
- **Loss of Public Confidence** – Repeated shutdowns undermine trust in democratic institutions and highlight how hyper-partisanship can hinder effective governance.

Lessons for India

- **Executive–Legislature Coordination:** India's parliamentary system works smoothly when the government and Parliament cooperate, ensuring the budget passes on time and governance continues without disruption.
- **Fiscal Discipline:** The US deficit problem shows why India must stick to fiscal responsibility, follow FRBM rules, and keep budgeting transparent to maintain economic stability.
- **Continuity Mechanisms:** Provisions like the Vote on Account and constitutional safeguards ensure essential services keep running even during political uncertainty, preventing shutdown-like situations.
- **Avoiding Polarisation:** The US gridlock shows how harmful political divisions can be. India needs strong dialogue and consensus in Parliament to avoid financial deadlocks.

Conclusion

The US shutdown highlights how executive–legislative conflict in a presidential system can disrupt governance. India's parliamentary model, despite its own challenges, provides stronger continuity and fiscal stability. The episode underscores the value of political cooperation, robust institutions, and responsible fiscal management.

Question- Government shutdowns in the US demonstrate how executive–legislative conflicts can disrupt governance and the economy. Examine how India's parliamentary system avoids such disruptions and suggest measures to strengthen fiscal discipline, continuity of services, and political cooperation.

Source: IE

Global Nuclear Order

UPSC Syllabus- GS 2 - India and international order

Introduction

The global nuclear order shows a sharp contradiction: nuclear weapons have not been used since 1945 and arsenals have declined, yet stability is weakening. A small nuclear club has remained intact, but modernisation, ambiguous testing signals, and weakening treaties now strain this system. Recent statements by Donald Trump about resuming U.S. nuclear testing, combined with expanding capabilities across major powers and a failing CTBT framework, suggest that long-standing restraint is under serious pressure.

Changed in the global Nuclear Order

1. **Non-use and shrinking arsenals:** Hiroshima and Nagasaki remain the only wartime uses, and since the late 1970s stockpiles have fallen sharply.

2. **A small and stable nuclear club:** Early fears of two dozen nuclear-armed states did not materialise. Today, nine states possess nuclear weapons, including the five permanent members of the UN Security Council and four later entrants.

3. **Achievements under strain:** These patterns look like success but do not inspire celebration. The nuclear order appears fragile, and moves and statements by Donald Trump are seen as weakening its supports.

Nuclear Testing is Re-emerging as a Threat

1. **Trump's Testing Signal:** Recent statements by **U.S. President Donald Trump** about restarting U.S. nuclear testing have injected fresh uncertainty. He claimed that other countries are testing and ordered the "Department of War" to begin tests

2. **Modernisation Without Explosions**

- The U.S., Russia, and China are **simultaneously designing and developing new nuclear weapons**.
- Russia has tested the **Burevestnik nuclear-powered cruise missile** and the **Poseidon underwater nuclear-powered torpedo**.

- China is developing **hypersonic missiles** and a **nuclear-capable hypersonic glide vehicle**.

- The U.S. is producing **new warheads**like the B61-13 gravity bomb and W76-2 warhead, and working on a new **submarine-launched cruise missile**.

- These programmes increase pressure to **move from lab work to fresh explosive tests**.

3. **Doctrinal shift:** Nuclear doctrines are being **reworked to deal with cyber and space technologies** and new missile defence ideas such as the U.S. **"golden dome"**. Together, these changes **blur lines between conventional and nuclear use** and **raise doubts about the future of the nuclear taboo**.

4. **Risk of Breaking the Taboo:** If any major power resumes explosive testing, others are likely to follow, undermining the CTBT norm and increasing the chances of a new nuclear arms race.

Conventions Regulate the Global Nuclear Order?

1. **Non-proliferation of Nuclear Weapons (NPT), 1968-** It was put forward by the USA, UK and USSR. It was signed in 1968 and came into force in 1970. The treaty has 3 pillars:
(a) **Non-proliferation-** Nuclear Weapon States (NWS) pledge not to transfer nuclear weapons and technology and Non-nuclear Weapon States pledge not to acquire nuclear weapons;
(b) **Disarmament-** All parties to pursue good-faith negotiations on effective measures to control nuclear arms race, and to general and complete disarmament;
(c) **Peaceful Use of Nuclear Energy-** The Treaty recognizes the right of all Parties to develop nuclear energy for peaceful purposes.
India considers the treaty discriminatory as it creates a club of 'nuclear haves' and a larger group of 'nuclear have-nots' by restricting the legal possession of nuclear weapons to those states that tested them before 1967. India hasn't signed the treaty.

2. **Comprehensive Nuclear-Test-Ban Treaty (CTBT)-** Seeks to ban all nuclear explosions for both civilian and military purposes. It prohibits nuclear testing, thus preventing further advancement of nuclear weapons capabilities.

3. **Treaty on the Prohibition of Nuclear Weapons, 2017-** It prohibits and makes it illegal to possess, use, produce, transfer, acquire, stockpile or deploy nuclear weapons. States are also prohibited from using or threatening to use nuclear weapons and other nuclear explosive devices. It came into force in 2021.

4. **Export Control Groupings-** Nuclear Suppliers Group (NSG) and the Missile Technology Control Regimes (MTCR) are some of the nuclear export control groupings. These ensure that nuclear fuel export doesn't result in nuclear weapons development.

5. **International Atomic Energy Agency (IAEA) Safeguards Agreement-** Governs the verification and inspection of nuclear facilities to ensure they are used for peaceful purposes and not for the development of nuclear weapons.

CTBT Framework is Failing

1. Incomplete ratification and geopolitical deadlock

- The **Comprehensive Test Ban Treaty (CTBT)** has **still not entered into force 29 years after negotiation**.

- It has 187 signatories, but key states such as the **U.S., China, Israel, Egypt, and Iran have not ratified it**.

- **Russia ratified and then withdrew ratification in 2023**. **India, Pakistan, and North Korea** have neither signed nor ratified. Given current geopolitics, **entry into force is highly unlikely**, leaving the treaty politically weak.

2. Ambiguity: The CTBT tells states not to carry out **"any nuclear weapon test explosion or any other nuclear explosion"**, but these terms were **never formally defined**.

3. Shift from disarmament to non-proliferation: CTBT began as a first step towards nuclear disarmament, but during 1995–96 negotiations it was recast mainly as a non-proliferation tool. Nuclear-weapon states kept their arsenals and focused on stopping others, weakening political support among non-nuclear states.

4. Allegations, monitoring, and eroding trust:

- In 2019-20, the U.S. State Department said Russia and China **"may have conducted low-yield tests"** inconsistent with the U.S. standard.

- The **CTBT Organisation**, using a network of **over 300 monitoring stations in 89 countries**, reported **no inconsistent activity**.

- This gap between political claims and technical findings **undermines trust in both national assessments and international monitoring**. As confidence falls, the **norm against nuclear explosive testing becomes more fragile**.

It's Impacts

1. **Strategic Stability:** Unclear rules on testing and new technologies make nuclear relations more unstable. Misunderstandings and miscalculations between major powers may grow, especially in crises.

2. **Arms race revival:** China's rapid arsenal expansion, U.S.–Russia modernisation, and possible end of New START point to a fresh nuclear arms race rather than gradual disarmament.

3. **Erosion of treaties and norms:** Weakening of the CTBT and strain on the NPT reduce legal and moral barriers against testing and proliferation.

4. **Regional ripple effects:** If major powers resume explosive tests, India and Pakistan are likely to follow, intensifying South Asian nuclear risks.

5. **Threat to nuclear taboo:** More "usable" nuclear options and **changing doctrines in cyber and space domains** put the eight-decade taboo against nuclear use under pressure.

Way forward

1. **Crafting a new nuclear framework:** The earlier nuclear order grew in a very different 20th-century setting. Today's world is more fractured and multipolar, yet nuclear dangers remain high. A new framework must reflect current power shifts and new technologies, while firmly keeping nuclear use outside the realm of acceptable options.

2. **Reviving arms control and restraint:** States need to bring back serious arms control thinking, update nuclear rules, and rebuild habits of transparency, dialogue, and restraint. These habits once helped to manage rivalry and can do so again.

3. **Putting non-use and risk reduction first:** The main goal must be to prevent any nuclear use. Countries should avoid actions that raise the chance of miscalculation, including vague testing signals and systems that shorten decision time.

4. **Heeding UN warnings on nuclear risk:** The UN Secretary-General has warned that nuclear risks are already "alarmingly high" and urged states to avoid steps that could trigger catastrophic escalation.

Conclusion

The nuclear order built on decades of restraint is under strain as Donald Trump's testing signals, renewed arms racing, and treaty erosion weaken past gains. Preventing any nuclear use must remain the core priority. A realistic, updated nuclear framework, guided by UN warnings about "alarmingly high" risks, is essential to protect the taboo against nuclear use.

For detailed information on **Global Nuclear Order** read this article here

Question for practice:

Discuss how renewed nuclear testing signals and weakening arms-control treaties are undermining the stability of the global nuclear order.

Source: **The Hindu**

Flexible inflation targeting

GS Paper 3- Indian Economy and issues relating to Planning, Mobilization of Resources, Growth, Development and Employment

Introduction

Flexible Inflation Targeting (FIT), adopted in 2016, mandates the RBI to maintain Consumer Price Index (CPI) inflation at **4% ± 2%.** As the framework comes up for **review in 2026**, key questions regarding the optimal target, inflation band, and the relevance of **headline versus core inflation** have come to the forefront.

Inflation Control as a Policy Priority

Inflation control remains a central monetary policy objective. High inflation acts as a **regressive consumption tax**, disproportionately hurting poorer households, eroding savings, discouraging investment, and creating macroeconomic uncertainty.

Post the dismantling of automatic monetisation in 1994, RBI gained greater operational autonomy, culminating in the adoption of FIT in 2016. Since then, inflation has remained largely range-bound despite global shocks, underscoring the resilience of the framework.

Headline vs Core Inflation debate

A key debate is whether monetary policy should target headline inflation (full CPI) or core inflation (excluding food and fuel). Arguments favouring core inflation assume food prices are driven by supply shocks beyond monetary control. However

- Food inflation is **not entirely supply-driven**; expansionary monetary conditions tend to amplify it.
- Inflation ultimately reflects **excess liquidity**, not isolated price spikes.
- Second-round effects are strong in India, where rising food prices raise wages and production costs.

Thus, **headline inflation** better captures pressures affecting household welfare and macro stability.

Appropriate Level of Inflation

Post-1991 empirical analysis shows a **non-linear growth-inflation relationship** with an inflection point near **4%**. Inflation beyond 4–6% significantly reduces growth. Forward-looking estimates (2026–2031) also place India's optimal inflation target around or slightly below 4%.

Determining the Acceptable Level of Inflation

The classic Phillips Curve trade-off between inflation and growth is now widely accepted to be **short-run only**. For India, post-1991 data shows a **non-linear relationship** between inflation and growth, with the inflection point near **3.98%**:

- Inflation up to around **4%** is growth-neutral or mildly supportive.
- Inflation above **4–6%** significantly reduces growth.

Forward-looking simulations for 2026–2031 indicate that an acceptable inflation target should remain **around or slightly below 4%**. There is little justification for raising it.

Conclusion

The FIT framework remains appropriate for India. A target around **4%**, with the existing ±2% band and headline inflation as the primary anchor, strikes the right balance between flexibility and stability. Sustained monetary–fiscal coordination will be essential to preserve credibility, protect vulnerable households, and support durable economic growth.

Question- Critically analyse the effectiveness of India's Flexible Inflation Targeting (FIT) framework and examine whether the current target of 4% ± 2% remains appropriate in the upcoming 2026 review

India's stray animal crisis and global intervention approaches

Source: The post **"India's stray animal crisis and global intervention approaches"** has been created, based on **"India's stray animal crisis and global intervention approaches"** published in "Indian Express" on 15th November 2025.

UPSC Syllabus: GS Paper 2- Governance

Context: The Supreme Court has recently directed the **immediate removal of stray dogs from public areas** and their relocation to designated shelters after sterilisation and vaccination. The order—mandating **uniform implementation across India** and requiring **compliance certificates within eight weeks**—comes at a time when India faces a severe stray animal and public health crisis, particularly linked to dog bites and rabies.

Why did the Supreme Court issue this order?

1. **Escalating public health threat:** The 2025 *State of Pet Homelessness Project* reports that India has **100.09 million dogs and cats**, including **85.61 million dogs** and **14.48 million cats**. **71% of dogs** and **61% of cats** in India are homeless. About **52.5 million dogs** and **8 million cats** roam freely as strays.
2. **High dog-bite cases and rabies deaths:** India recorded **3.7 million dog-bite cases in 2024**. **99% of rabies deaths** in India occur due to dog bites. Rabies is almost always fatal once symptoms appear.
3. **Public safety and administrative concerns:** The Court emphasised uniform compliance and directed that **strays must not be released back to the pickup location**, diverging from earlier practices. The ruling reflects growing national concern over uncontrolled stray populations, rising attacks, and preventable deaths.

How does India currently manage its stray population?

India's framework is governed by the **Animal Birth Control (ABC) Rules, 2023**, based on humane and scientific population management.

1. Role of Local Bodies: Municipalities and panchayats are responsible for **sterilisation and vaccination** through AWBI-approved organisations.

2. Humane Capture and Surgery Norms: All procedures must prevent cruelty and follow veterinary standards.

3. CNVR Model (Catch–Neuter–Vaccinate–Return): Traditionally mandated returning animals to their original territories to prevent pack aggression and maintain ecological balance.

4. Standards for ABC Centres: Adequate kennel facilities, post-operative care, and access to veterinary hospitals.

5. Shift after SC Order: The Court's direction to **relocate and not release strays back** marks a major departure from previous CNVR norms.

How do other countries manage stray animals?

1. **Greece:** Municipalities run comprehensive systems for **capture, sterilisation, registration, rehoming**, and in some cases euthanasia after 3 months. Pets must be **microchipped and registered**.
2. **Cyprus:** Strict **Dog Licensing Law** for all dogs over two months old. Strays are held for 15 days for owners to reclaim; unclaimed animals are rehomed or euthanised. Cat sterilisation is limited due to **insufficient funding**.

3. **Netherlands:** Considered the **only country with zero stray dogs**. Achieved through: Long-standing anti-cruelty laws (since 1864), **High taxes** on pet purchase to discourage abandonment, Nationwide CNVR and a **dedicated animal police force.**

Challenges in India's Stray Management System

1. **Insufficient ABC infrastructure:** Lack of adequate sterilisation centres, veterinary staff, and shelter space.
2. **Low sterilisation coverage:** Only a small fraction of strays undergo sterilisation, allowing rapid repopulation.
3. **Weak enforcement of pet ownership laws:** Poor registration compliance, unchecked breeding, and widespread pet abandonment.
4. **Funding and capacity gaps:** Many local bodies lack dedicated budgets and trained personnel.
5. **Public behaviour and community resistance:** Street feeding in unregulated public spaces leads to territorial aggression and conflicts.
6. **Absence of reliable stray population data:** No standardised national stray census hampers planning.
7. **High rabies prevalence and low vaccination coverage:** Limits the effectiveness of sterilisation programmes.

Way Forward

1. Strengthen ABC and Shelter Infrastructure: Establish more ABC centres, mobile sterilisation units, and improve veterinary capacity.

2. Enforce Responsible Pet Ownership: Mandatory **microchipping**, registration, and breeding regulations. Strict penalties for abandonment.

3. National Mission on Stray Animal Management: A centrally coordinated programme with uniform standards—on the lines of Swachh Bharat/National Rabies Control Programme.

4. Digital Monitoring Systems: GIS-based dog population mapping, online ABC dashboards, and tracking of sterilised/vaccinated animals.

5. Regulated Feeding Zones: Create designated community feeding points supervised by RWAs/ULBs to reduce human–animal conflict.

6. Learn from Global Best Practices: Stronger pet taxation and anti-cruelty enforcement (Netherlands model). Municipal responsibility and rehoming systems (Greece).

7. Public Awareness and Adoption Drives: Large-scale campaigns to promote vaccination, sterilisation, adoption, and responsible ownership.

Conclusion: India's stray animal crisis is a multidimensional problem involving public health, animal welfare, and municipal governance. The Supreme Court's mandate underscores the urgent need for scientific, humane, and enforceable mechanisms for population control. A combination of **strong legal enforcement**, **robust infrastructure**, and **community participation** is essential to create safe public spaces while ensuring compassionate treatment of animals.

Question: Why did the Supreme Court order the removal of stray dogs, and how does India manage its stray population? Examine the challenges and suggest a way forward.

India's deep-tech democracy for inclusive AI

Source: The post **"India's deep-tech democracy for inclusive AI"** has been created, based on **"India's deep-tech democracy for inclusive AI"** published in "The Hindu" on 15th November 2025.

UPSC Syllabus: GS Paper 3- Science and technology

Context: Artificial Intelligence has emerged as a defining force in shaping economies and transforming societies, but access to AI capacity remains unequal across the world. A handful of advanced nations control most high-end compute, proprietary datasets, and talent, creating a new digital divide between technology creators and technology consumers. India, through the **IndiaAI Mission (2024)**, is attempting to bridge this divide by treating AI as a **public good** and building a democratic, inclusive, and sovereign AI ecosystem.

How IndiaAI Mission Addresses Global AI Imbalances

1. Democratising access to compute, data, and talent: India is creating a **digital public infrastructure for AI** that expands access to shared compute, open data, and decentralised talent. This ensures that start-ups, researchers, and students from every region can participate in technological progress.

2. Building India's first national AI compute grid: Over **38,000 GPUs** are being deployed to form India's national AI compute grid, reducing dependence on global tech giants and lowering entry barriers for innovators.

3. Unlocking open and locally relevant datasets: The **AI Kosh platform** is providing **360+ curated, non-personal datasets** across agriculture, climate, health, and governance. This helps innovators build solutions grounded in India's diverse realities rather than imported assumptions.

4. Promoting multilingual, inclusive AI: The **Digital India Bhashini framework** supports AI tools in **22 Indian languages**, while Project Vaani's **150,000-hour dataset** strengthens language diversity. This makes AI accessible to India's linguistic and cultural spectrum.

5. Decentralising AI innovation: The Mission is establishing **570 AI labs** in Tier-2 and Tier-3 cities and providing **13,500 AI fellowships**, ensuring deep-tech innovation is not limited to metropolitan hubs.

6. Embedding India's collaborative governance approach: India's model draws from the **Samaj–Sarkar–Bazaar philosophy**, ensuring societal, governmental, and market cooperation so that technologies are ethical, transparent, and people-centric.

7. Safe and trusted AI ecosystem: A dedicated **safe and trusted AI pillar** is framing safeguards against misinformation, deepfakes, and algorithmic biases. Ethical guardrails are being built into AI systems to ensure accountability and human dignity.

8. Leveraging India's Digital Public Infrastructure (DPI): AI integrated with platforms such as UPI, Aadhaar, and ONDC ensures population-scale impact. When AI is trained on Indian languages and delivered through public platforms, benefits directly reach farmers, small traders, students, and citizens at the last mile.

9. Global collaboration through India-AI Impact Summit 2026: The upcoming summit will convene leaders from the Global South to explore how AI can drive **equity, accessibility, and inclusive growth**, signalling India's outward-looking and cooperative AI leadership.

Challenges in India's Public AI Model

1. High cost and sustainability of compute infrastructure: Massive GPU deployment requires continuous investment, long-term maintenance, and stable power and cooling infrastructure.

2. Limited availability of specialised AI talent: Although India is expanding training, the demand for high-end AI researchers, data scientists, and semiconductor specialists remains far greater than supply.

3. Concerns around data governance and privacy: Large-scale open datasets raise questions about data security, consent, anonymisation, and responsible use.

4. Risk of algorithmic bias and unethical AI deployment: Even with safeguards, biases in models trained on uneven datasets may reinforce social inequalities.

5. Uneven adoption across states and institutions: Some states, rural colleges, and smaller institutions may not immediately benefit due to weak digital infrastructure and limited awareness.

6. Dependence on imported hardware: India still relies heavily on foreign semiconductor supply chains, making compute infrastructure vulnerable to global disruptions.

Way Forward

1. Accelerate domestic semiconductor manufacturing: Strengthening India's chip ecosystem will reduce hardware dependency and ensure long-term compute sovereignty.

2. Establish national ethical AI and audit frameworks: Mandatory AI audits, impact assessments, and transparency standards can minimise risks of bias, misinformation, and misuse.

3. Expand training for AI talent at scale: AI courses in universities, vocational centres, and industry partnerships must be enhanced to build a strong talent pipeline.

4. Strengthen data protection and open-data governance: Robust privacy frameworks, anonymisation protocols, and secure data-sharing mechanisms will enhance trust in the ecosystem.

5. Increase collaboration with the Global South: Joint datasets, shared compute, and knowledge partnerships with Africa, Southeast Asia, and Latin America can help build a collective AI capacity.

6. Promote inclusive access through DPI integration: Linking AI innovations with UPI, ONDC, DigiLocker, and telehealth platforms will ensure that benefits reach the poorest and most remote communities.

7. Encourage responsible industry participation: Incentives for start-ups and ethical guidelines for private players can foster innovation while maintaining public-interest safeguards.

Conclusion: India's public model of AI innovation represents a shift from proprietary, exclusive technological progress to **democratic, accountable, and inclusive AI development**. By socialising access to compute, data, and talent, India is ensuring that the competitive frontier shifts from "who can afford AI" to "who can innovate responsibly." As the world prepares for the India-AI Impact Summit 2026, India's message is clear: AI must uplift all and leave no one behind. The true measure of technological progress lies not just in advancing machines, but in advancing human dignity and shared prosperity.

Question: India is pioneering a public model of AI innovation through the IndiaAI Mission. Discuss how this model addresses global AI imbalances. Also highlight key challenges and suggest a way forward.

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